

APF



An MDM PUBLICATION
Issue 33 – March 2010

www.mdmpublishing.com

ASIA PACIFIC FIRE MAGAZINE

REPORTING TO THE ASIA PACIFIC FIRE PROTECTION AND FIRE SERVICE INDUSTRY

TASK FORCE TIPS, INC.



3701 Innovation Way, Valparaiso, IN 46383-9327 USA
International +1.219.548.4000 • www.tft.com • intsales@tft.com

FDIC Booth 3302

19 - 24 APRIL 2010

INTERSCHUTZ A54 Hall 5

7 - 12 JUNE 2010



Mid-Range

260 - 760 l/min

AUTOMATIC NOZZLES WITH STAINLESS STEEL SPINNING TEETH



Standard 7 bar Setting



Low Pressure Setting

For excellent quality fire fighting equipment visit www.tft.com and call your local distributor for a demonstration.

Remote Controlled and Manual Monitors



ATEX Version Available **€ €**
4500 l/min
Hurricane Remote Controlled
and Manual Monitor



ATEX Version Available **€ €**
6000 l/min
Typhoon Remote Controlled
and Manual Monitor



ATEX Version Available **€ €**
8000 l/min
Monsoon Remote Controlled
and Manual Monitor



AUSTRALIA
Gaam Emergency Products-AU
Phone : 61394661244
Fax : 61394664743
iprice@tycoint.com
www.gaam.com.au



INDIA
Foremost Technico Pvt Ltd
Phone: +91 (11) 2619 6982
Fax: +91 (11) 2616 6961
foremost@hathway.com
www.foremost-india.com



MALAYSIA
Sentrix Technology Sdn Bhd
Phone: +603 8023-5228
Fax: +603 8023-5618
chong@sentrix.com.my
www.sentrix.com.my



SINGAPORE
S.K. Fire Pte. Ltd.
Phone: 6568623155
Fax : 6568620273
houchin@skfire.com
www.skfire.com



CHINA
Shanghai Jin De Industry
Phone: 862136050599
Fax: 862136055599
sjinde@163.com
www.sjinde.com



INDONESIA
Pt Palmas Entraco
Phone: 6221384 1681
Fax: 6221380 2660
sales@palmas.co.id



NEW ZEALAND
Tyco Safety Products
Phone: 6445608127
Fax: 6498270844
tsp.sales.nz@tycoint.com
www.tycoservices.co.nz



SOUTH KOREA
Shilla Fire Co., Ltd.
Phone: 820236659011
Fax: 820236639113
kofire77@hotmail.com
www.firekorea.com



HONG KONG
Rotter International Ltd.
Phone: 85227517770
Fax: 85227562051
jacky@rotter.com.hk
www.rotterbiz.com



JAPAN / TAIWAN
Yone Corporation
Phone: 81758211185
Fax: 81758012263
t.yone@myad.jp
www.yone-co.co.jp



PHILIPPINES
Alliance Industrial Sales
Phone: 6328908818
Fax: 6328960083
alliance8_jcy@pacific.net.ph



THAILAND
Anti-fire Co., Ltd.
Phone: 66 2 259-6898
Fax: 66 2 258-2422
sithichai@antifire.com
www.antifire.com

www.tft.com

**March 2010
Issue 33**



Front Cover Picture: The Bushfire CRC conducted research trials of a DC-10 Very Large Air Tanker in the state of Victoria this summer, in an effort to determine whether such aircraft are suitable in Australian conditions. The DC-10 is capable of dropping 42,000 litres of fuel retardant (as pictured on the cover), which is more than four times as much as some of the helicopters currently used for aerial suppression of wildfires

Publishers

Mark Seton & David Staddon

Editorial Contributors

Pichaya Chantranuwat, Stefan Brügger, Ted H Schaefer, Bogdan Z Dlugogorski, Eric M Kennedy, Paul Gibson, Kevin Kenny, Konrad Marshall, John Vieweger

APF is published quarterly by:
MDM Publishing Ltd
The Abbey Manor Business Centre,
The Abbey, Preston Road, Yeovil,
Somerset BA20 2EN, United Kingdom
Tel: +44 (0) 1935 426 428
Fax: +44 (0) 1935 426 926
Email: mark.seton@apfmag.com
Website: www.mdmpublishing.com

©All rights reserved

Subscription Rates

Sterling – £50.00
AUS Dollars – \$100.00
US Dollars – \$70.00
(Prices include Postage and Packing)
ISSN – 1476-1386

DISCLAIMER:

The views and opinions expressed in ASIA PACIFIC FIRE MAGAZINE are not necessarily those of MDM Publishing Ltd. The magazine and publishers are in no way responsible or legally liable for any errors or anomalies made within the editorial by our authors. All articles are protected by copyright and written permission must be sought from the publishers for reprinting or any form of duplication of any of the magazines content. Any queries should be addressed in writing to the publishers.

Reprints of articles are available on request. Prices on application to the Publishers.

Page design by Dorchester
Typesetting Group Ltd
Printed in Singapore

Contents



21-25



27-32



35-38



41-44

03 NFPA Foreword

**07-18 News &
Product Profiles**

**21-25 Santika -
One Year On**

**27-32 PPV Fan
Roundup**

**35-38 Aspirating
Smoke Detectors for
Early Detection**

**41-44 Vapour
Suppression with Class
B Foams**

**47-50 Selection
Considerations for
Clean Agent Fire
Suppression Systems**

**53-55 Fighting
Fires in Hostile Marine
Environments**

**57-58 The
Technology of Fire
Fighting - VLAT**

**61-65 Next
Evolution AR-AFFF**

**66-71 Distributor &
Representative Office
Listing**

72 Advertisers' Index



47-50



53-55



57-58



61-65

MEMBERSHIP



Up-To-Date? It's Up to You!

NFPA® membership is indispensable for more than 81,000 professionals worldwide. What about you? It's an easy decision for anyone involved with protecting people and property, because NFPA keeps members on top of breakthroughs, research, and technology...and in control of their careers. **Join now and SAVE 10%** on NFPA codes, products, and seminars, while **you stay up-to-date** with:

- **NFPA Journal®**, the award-winning bimonthly membership magazine loaded with articles, codes and standards information, investigations, case studies, and reports
- Answers to your code questions from NFPA's experienced fire protection specialists
- Online issues of **NFPA News** for codes and standards activities, and **NFPA Update** for training opportunities and events
- FREE membership in any of 16 industry-specific sections including Fire Service; Building Fire Safety Systems; Health Care; Electrical; and Architects, Engineers, and Building Officials
- The latest **NFPA Journal Buyers' Guide**—your bonus gift valued at \$40

Gain a decided advantage on the job. Join NFPA today!

Become part of the world's largest organization for fire, electrical, and building safety professionals and stay up-to-date for only \$150 annual dues—satisfaction guaranteed.

**To join call 1-617-770-3000, or visit
nfpacatalog.org.**



By Olga Caledonia

Executive Director
International
Operations, NFPA

Foreword

The Role of our international members and fellow organizations

The true value, strength and foundation of NFPA's international programs can be found in its membership. Our members are committed participants in the continuous process of monitoring and improving fire safety around the world. Also, volunteers play a very important role sharing a common bond – a concern for fire and respect for life. The strength of a diverse membership and volunteers will continue to mature based on the recognition of existing needs and a global fire protection community facing complex issues.

Earlier this year, in the first issue of NFPA's member publication, the *NFPA Journal*, the feature article and cover reads, *Santika Remembered*. The author, Pichaya Chantranuwat, is a NFPA member from Thailand who shows his advocacy by being an active participant in the continuous process of monitoring and improving fire and life safety in Bangkok. You will be able to read the article on page 17 of this issue of Asia Pacific Fire. This is just a recent example of international members directly participating with NFPA and one of the many ways we continue to reach out to our membership for their advice which will directly benefit our international constituency.

Looking ahead, we have been implementing a number of new ways to involve our international members. Among the many programs, the Association is currently focusing its efforts in international cooperation through "local" private or government organizations which will promote knowledge of standard development activities and will allow countries to respond quickly to newly emerging issues in fire, building, electrical and life safety. Most of our members are active participants in their countries' standardization process. This is a great vehicle for our members to act locally in their respective languages. At present, we have formal agreements in South Korea, China, Australia, India and Japan. We intend to do everything possible to build upon these cooperative relationships. I envision that we will increase the number of partners in other Asian countries

and expect the cooperation to grow to achieve common goals and objectives in the field of fire safety.

Another important example of cooperation is our partnership with *Asia Pacific Fire Magazine*. Working through this important media, NFPA's voice reaches thousands of professionals in the Asia Pacific. NFPA has always believed that one of the most important tools for reaching out to our membership and beyond is through industry magazines and participation in conferences. The growing number of periodicals, both print and electronic and conferences in the region that either references or highlights NFPA's codes and standards has increased tremendously during the last decade. NFPA's importance and influence in fire, electrical, building and life safety throughout the world is a status that each one of our members and partners should take a great deal of pride in helping us achieve.

One of the underlying principles upon which NFPA was founded is that people – namely, our members and volunteers – are our best resource in the fight against fire. The shared knowledge and experiences of our international members is very valuable. I want to encourage you; the readers of this important Journal, to become involved and join forces with NFPA members and volunteers in your countries. We, in turn, will continue to look for ways to become more accessible and use our common bond – a concern for life safety and respect for life – in the interest of fire safety. **APF**



MDM Pu
WORLDWIDE

www.mdmpu

Hi-Tech P

FEATU

VIRTUAL ELECTRONIC MAGAZINES

BANNER ADVERTISEMENTS

FULL PDF FILE DOWNLOADS

LIVE LINKS

SIMPL
COMPA

MDM Publishing Ltd, The Abbey Manor Business Centre,

Tel: +44 (0) 1935 426 428

www.mdmpublishing.com

blishing Ltd
MEDIA

blishing.com **ortal Site** **RING**

FULL VIRTUAL ARCHIVE OF BACK ISSUES

LIVE REAL PAGE TURNING SOFTWARE

EVENTS PAGE

AND MUCH, MUCH MORE ...

Y NO **RISON**



The Abbey, Preston Road, Yeovil, Somerset BA20 2EN, UK

Fax: +44 (0) 1935 426 926

www.mdmpublishing.com

Register online
and save US\$5
on ADMISSION TICKET
www.firec.org



FIREC2010

MALAYSIA'S OFFICIAL FIRE PROTECTION AND RESCUE EXPO & CONFERENCE

15 - 18 JUNE 2010 • KUALA LUMPUR CONVENTION CENTRE

- 15 - 18 JUNE 2010
- KUALA LUMPUR CONVENTION CENTRE



**MALAYSIA'S NO.1
FIRE PROTECTION &
RESCUE EVENT**

Official Publication :



Co-organised & Managed by:



AMB Exhibitions Sdn Bhd (414985-U)
Suite 1701, 17th Flr Plaza Permata (IGB Plaza)
6 Jln Kampar, off Jln Tun Razak
50400 Kuala Lumpur, Malaysia
Tel: (603) 4045 4993 Fax: (603) 4045 4989
E-mail: support@ambexpo.com

www.ambexpo.com

REPLY COUPON

☐ Please send me more information on **FIREC 2010 EXPO & FORUM**

I would like to ☐ Exhibit ☐ Visit ☐ Attend Forum

Name: _____ Title: _____

Company's Name: _____ OR ATTACH

Address: _____ YOUR BUSINESS

_____ CARD HERE

Tel: _____ Fax: _____

Email: _____

For further information, please complete and fax to:
603-4045 4989

www.firec.org

Spectacular Flight of Panther ARFF Vehicles

ROSENBAUER, together with its Australian partner Sasgar, sold two CA5 PANTHERS 6x6 to an island outcrop in the Pacific Ocean half way between Australia and New Zealand called Norfolk Island. The area of this island is 8 km long and 5 km wide, with a population of 1500 permanent residents.

Both PANTHER vehicles will be in service at Norfolk Island Airport. The island with its extension of about 35 km² is serviced by the two airlines Norfolk Air and Air New Zealand. Both airlines operate a Boeing 737, which requires ICAO airport category 6.

The Norfolk Island Fire Service also provides an Aerodrome Rescue and Fire fighting Service to the international airport of Norfolk Island.



Normally you would not sell these large capacity vehicles to an island of this size; however Norfolk is used as alternate emergency airport for the Pacific within their air space. Apart from airport fire fighting they also have the requirement for maintaining the full storage depot and electrical power facility.

With the redeployment of aviation vehicles from Air Services Australia no longer available to Norfolk Island, suitable vehicles have been ordered from ROSENBAUER. The ROSENBAUER Panther ARFF vehicles have a long tramp to the other side of the world: the distance between Leonding and Norfolk Island is about 18,000 km.

Delivery of the PANTHERS by the Royal Australian Airforce

After completion of the signed order the difficulty faced on how to deliver these two vehicles to an island that has no wharf facilities, therefore the only alternative was to fly these vehicles from Australia to Norfolk Island; the

finance minister from Norfolk then started the long and tedious job of convincing the Royal Australian Airforce to fly the two PANTHERS over to Norfolk Island on C17 Boeing Globemaster aeroplanes.

At RAAF Amberley airbase south west of Brisbane, both vehicles were prepared for flight. Unfortunately due to the main airstrip at Amberley under repair the shorter cross strip was utilized and the decision was made to make two flights with one Panther in each flight.

As the C17 has the capacity to reverse which is done with rear door open back upon reaching the furthest point of the airstrip the rear ramp was closed, the four engines were brought up to full speed. Parking brake was released with only 400m of the airstrip used to take off. Flying from RAAF Amberley to Norfolk is 1 hour and 45 minutes on arrival at Norfolk three quarters of the town population and all school children had lined the side of the strip to greet the arrival of the new PANTHER.



For more information, please contact:
Rosenbauer International AG
www.rosenbauer.com

What's next?

Come and see Holmatro's latest innovations at Interschutz

This is the year of Interschutz, the largest fire and rescue exhibition in the world. Interschutz has always been the perfect international platform to present our latest innovations to the rescue world. After the introduction five years ago of CORE™ Technology, the revolutionary one hose system, it is time to show you some exciting new products and technologies. Come and see us at our stand (E26 in Hall 2) at Interschutz to find out what's next...

Throughout the years HOLMATRO has supported rescuers all over the world with rescue tools and technologies that have made their working procedures quicker, safer and easier. Innovation is at the heart of Holmatro and one of the things expected from us. So also this year, at Interschutz 2010, we will not let you down!

Find out what's next...

2002: First New Car Technology (NCT™) cutters, specially developed to cut the hard materials and reinforced constructions found in modern cars. Their U-shaped blades easily surround wide B- and C-posts and pull material into the cutting recess, allowing it to be cut at the strongest point of the cutter.

2005: Introduction of CORE™ Technology, Holmatro's revolutionary one-hose system. High-pressure hose inside and protected by low-pressure hose. Para-aramid reinforced: no kinking, no pinholes, easy (un)rolling.

2005: New flat central bolt construction on cutters and combitools. Squeezes the blades together more tightly, resulting in less blade separation and an improved cutting performance. The i-Bolt also provides better access to narrow spaces.

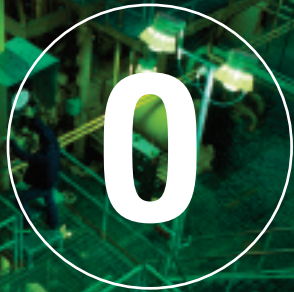
2005: Integrated LED lighting in carrying handles. Never work in your own shadow again.

2005: Speed Valve on spreaders and rams for quicker tool opening. Saves valuable time.

2010: What's next? Find out at Interschutz 2010, June 7 – 12, Leipzig, Germany. Holmatro stand: E26, Hall 2.

For more information visit our website: www.holmatro.com/rescue



**F****FUEL STORAGE/HANDLING****O****OFFSHORE/MARINE****A****AVIATION****M****MANUFACTURING**

JUST A FEW OF THE PLACES ANSUL® FOAM MAKES PERFECT SENSE.

For that matter, advanced ANSUL Firefighting Foams protect flammable liquids wherever they are manufactured, stored, dispensed, processed or transported. Every ANSUL foam — AFFF, AR-AFFF, High-Expansion, fluoroprotein and protein — is the result of extensive research, development and testing at the ANSUL Fire Technology Center. Our concentrates are tested to international standards and specifications. And ANSUL foam is delivered through a wide range of portable and fixed foam systems, generators, proportioning equipment and discharge devices.

ANSUL Firefighting Foams. No matter how you spell it, it comes out **P-R-O-T-E-C-T-I-O-N**.



www.ansulinfo.com/apfoam

by Tyco Fire Suppression & Building Products

Formulating The Right Fire Solution For Critical Industry Needs

For industries involved in the manufacturing, storage or transportation of flammable liquids and materials, the threat of an erupting fire is one that looms constantly. When it comes to the fuel storage industry, today's new fuel formulations present many challenges. Increasingly advanced, modern fuels are also more unstable and flammable, posing significant fire risks. Similarly, oil refineries and petrochemical facilities that handle volatile products are also naturally exposed to some of the most dangerous fire and safety hazards.

In particular, fire hazards in the aviation industry stem primarily from flammable jet fuel. Given the extensive costs of hangars and modern aircrafts, a fire would result in substantial asset and property loss. In the offshore and marine industry, vessels and jackup rigs operate in highly dangerous environments on a daily basis, where potential fire hazards are not only dangerous but also occur in remote locations.

Likewise, manufacturing plants that employ heavy machinery in enclosed spaces – such as the furniture industry – may face substantial losses in terms of impacted deliveries, were a fire to bring their manufacturing process to a standstill.

Pioneering the foam revolution

When it comes to foam agents, Tyco Fire Suppression & Building Products' (TFS&BP) expertise stems right from the source. Together with the U.S. Navy, TFS&BP's ANSUL brand developed the world's first foam-compatible dry chemical in 1960. Further innovation resulted in the revolutionary twin-agent concept that combines the superior knockdown capability of dry chemical with the securing power of aqueous film-forming foam (AFFF).

In 1988, company chemists invented ANSULITE® 3x3 Foam Concentrate, the first alcohol-resistant Aqueous Film-Forming Foam (AFFF) capable of being used at a 3% concentrate on both polar-solvent and hydrocarbon fuels.

As the world's leading manufacturer of special hazard fire suppression systems and products, TFS&BP under the company's ANSUL brand offers the most comprehensive fire suppression systems worldwide. Backed by over 70 years of industry experience and expertise in special hazard fire suppression, TFS&BP's constant research and development ensures that on top of uncompromising quality and effectiveness, clients are always assured of the latest technology in integrated fire suppression.



The power of foam

Firefighting foam: Back to basics

Comprised of a foam concentrate, water and air, firefighting foam is a stable mass of small, air-filled fluid bubbles with a lower density than oil, gasoline or water. Combined with the agent, water is up to five times more effective on fires, providing faster flame knockdown, control and securement. The increased effectiveness and reduced amount of water used also translates into less water damage to vital assets and a reduced water demand where supplies are not readily available.

Balanced pressure proportioning ensures that foam concentrate pressure is balanced with water pressure at the proportioner inlet, this allows the proper amount of foam concentrate to be metered into the water stream when generating the foam solution.

For aspirating discharge devices, foam solution passes through an opening, past air inlets, and into an expansion area to produce expanded foam. In non-aspirating devices, the foam solution doesn't mix with air until it first passes through the opening and discharge outlet.

PRODUCT PROFILE

Putting foam to the test

When evaluating what foam concentrate to use, it is vital to critically examine the agent's performance and the appropriate safety standards. In short, does it meet all regulatory specifications for product performance?

Recognised independent testing agencies such as Underwriters Laboratories (UL) and Factory Mutual (FM) and other international approval authorities observe strict standards for product performance. ANSULITE foam concentrates not only meet continued compliance with the relevant regulatory specifications, users can also be assured of their extended shelf life. Premium ANSULITE AFFF, JET-X high-expansion, and SILV-EX Plus Class A foam concentrates boast a shelf life of 20-25 years, while all other non-synthetic ANSUL foam agents have a normal shelf life of between 7-10 years.

For maximum performance while minimising environmental impact, all ANSUL brand foam concentrates are also biodegradable.

A foam solution for every fight

The extensive line of ANSUL/ANSULITE brand foam products includes premium foam concentrates for both Class A and B fires, proportioning equipment for various system arrangements, and an array of discharge devices to cover your application.

Class A foam agents

Class A foam reduces water's surface tension to permit the penetration of Class A fuel.

SILV-EX® Plus

Applied on the ground or through the air, ANSUL SILV-EX Plus foam immediately wets, cools, and insulates a fire. Especially effective against forest fires and fires in coal mines, power generation (coal bunkers), structures, tire and rubber factories, lumber mills, and paper warehouses.

Created to perform specifically on Class A combustible materials, SILV-EX Plus foam concentrate is compatible for use in compressed air foam systems (CAFS) over the use range of 0.01% to 1.0%. Typical applications include coal mine and bunker fires, and tire and structure fires.

Class B foam agents

ANSULITE foam concentrates also combat Class B fires such as petroleum-based products, flammable and combustible liquids.

ANSULITE® Aqueous Film-Forming Foam (AFFF)

The versatile ANSULITE AFFF features excellent flame knockdown and good burnback resistance, and can be applied through a wide variety of delivery systems. This makes it the perfect choice for airports, refineries, manufacturing plants, and other operations involving the transportation, processing or handling of flammable liquids. ANSULITE AFFF is available as 1%, 3%, and 6% concentrates, or as 1% and 3% freeze-protected concentrates.

ANSULITE® Alcohol-Resistant AFFF Concentrates (AR-AFFF)

Based on AFFF chemistry to which a polymer is added, ANSULITE AR-AFFFs are effective on fires involving polar solvents such as ethanol, and hydrocarbon fuels such as gasoline. ANSULITE 3X3 LV or ANSULITE ARC 3% or 6% can be proportioned according to the type of fuel – hydrocarbon or polar solvents.

Protein Foam Concentrates

Recommended for extinguishing fires involving hydrocarbons, Protein Foams at 3% concentrate produce stable mechanical foam with excellent expansion properties and good burnback resistance characteristics. They are typically used to protect flammable and combustible liquids where they are stored, transported and processed.

Fluoroprotein Foam Concentrates

Compared to protein foams, ANSUL Fluoroprotein Foam Concentrates provide better control and extinguishment, greater fluidity and superior resistance to fuel contamination. Available at 3% concentrate with excellent burnback resistance and exceptional efficacy on fires involving hydrocarbon bulk storage and handling, such as refineries and petrochemical facilities.



High-expansion foam agents

Especially useful on fuels such as liquefied natural gas (cryogenic fuels) for vapour suppression and control, High-Expansion Foam Concentrates are used on large areas in total flooding and three-dimensional applications, such as warehouses and ship cargo holds.

JET-X®

For use on class A, B, and LNG fires, JET-X high-expansion foam is available as both a 2% and 2.75% concentrate. Capable of flooding large rooms and enclosures when used with JET-X high-expansion generators, JET-X foam effectively suppresses all types of spill fires with minimal water damage to structure or contents and little or no damage to electrical equipment.

In the business of meeting heightened fire risks

Choosing the right foam for the right application is as critical as the need for dependability and efficacy. Be it fuel storage, oil and gas facilities, aviation or manufacturing, ANSUL brand foams offer a comprehensive range of agents that address the challenging fire suppression needs of each at-risk industry. On top of excellent flame knockdown, efficient burnback resistance and control of toxic and hazardous runoff, each ANSUL brand foam agent also adheres to the strictest international quality and safety standards. No matter the risks and challenges, at-risk industries and firefighters alike can rest assured that ANSUL foam products deliver superior fire suppression qualities – especially when they need it most.

APF



by Tyco Fire Suppression & Building Products

For more information, please contact:

Tyco Fire Suppression & Building Products – Asia Pacific

2 Serangoon North Avenue 5
#07-01 Fu Yu Building
Singapore 554911
Tel: +65 6577 4360
Fax: +65 6481 8791
Email: sales-ap@tycofp.com
Website: www.ansul.com

Quality products by Janus Fire Systems

JANUS FIRE SYSTEMS is a U.S.-based manufacturer of Underwriters Laboratories Listed and Factory Mutual Approved special hazard fire systems designed in accordance with the US National Fire Protection Agency (NFPA).

Formed by four fire suppression professionals with over 120 years of collective industry experience, the expert Janus Fire Systems® staff designs and tests its systems and products at its Corporate Headquarters and Research Facility in Crown Point, Indiana, USA. Products are manufactured in a 27,880 m² facility located just outside of Birmingham, Alabama, USA. All manufacturing processes are supervised by internal Quality Control programs in compliance with ISO 9001:2000 and ISO 14001:2004 as certified by Det Norske Veritas (DNV). Janus Fire Systems® products claim the benefit of 38 years of manufacturing expertise and the backing of parent company Amerex Corporation (an affiliate of McWane, Inc.)

Working with authorized integrators, Janus Fire Systems designs and produces engineered Clean Agent Systems that are safe for humans, minimize collateral damage, and extinguish fire rapidly. Janus Fire Systems® has also developed the user-friendly, UL and FM tested Janus Design Suite™ Hydraulic Flow Calculation Software. Janus Fire Systems augments its Clean



Agent Systems with an array of conventional and addressable control panels, detection, and associated devices including air sampling detection systems.

Janus Fire Systems® also produces and designs both High-Pressure and Low-Pressure Carbon Dioxide Systems and is capable of upgrading existing CO₂ systems to comply with the new safety requirements listed in the latest editions of NFPA Standard 12.

Additional product offerings include

hybrid water mist, suppression foam, and associated design and engineering capabilities.

Quality products combined with experience, innovation, and the Janus Fire Systems® commitment to excellence make Janus Fire Systems® your gateway to a new kind of service.

**Contact Janus Fire Systems at
1-219-663-1600 or visit their website:
www.janusfiresystems.com**

Euramco Safety opens Dubai Warehouse for RAMFAN Fire & Smoke Removal Fans

Euramco Safety, a manufacturer of RAMFAN Portable Ventilation Fans has opened a warehouse in Dubai, in the Jebel Ali Free Zone with a full range of RAMFAN Gas and Electric Fire Rescue and Smoke Removal Fans in stock.

RAMFAN's Gas and Electric line of Fire and Smoke Removal fans utilise Turbo Fan Blade Technology for outstanding airflow performance, certified by third party testing. Sizes include: 89" (20cm), 169" (40cm) and 219" (54cm) engineered for portability, dependability and outstanding airflow.

RAMFAN Gas and Electric PPV Fans offer outstanding airflow performance in the all important Set-Up/Performance Zone, from 1 to 3 meters back from the structure opening.

In addition to PPV Fans, Euramco Safety offers ATEX Certified Explosion Proof Fans, Lightweight Utility Fans, Ducting and accessories.

For more information contact Euramco Safety at: +1-619-670-9590 or visit www.euramcosafety.com

Building Code of Australia 2010 with over 3000 illustrations

The HENDRY GROUP launches BCA Illustrated, a visual information bonanza for everyone bound by regulations in the building and property industries.

Announcing the May 2010 launch of BCA Illustrated by Hendry, in strategic partnership with the Australian Building Codes Board.

By using the visual language of the building industry, BCA Illustrated explains BCA clauses through over 3000 explanatory illustrations. It offers various clause interpretations and multiple illustrations.

BCA Illustrated is produced by experienced national building surveyors the Hendry Group. "With 3000 illustrations available through the BCA Illustrated Desktop Edition (a downloadable program) or the Online Edition (a website database), users of the BCA now have a sophisticated, intuitive service that bridges the gap in Australia's Building Standards," says the Group's Chairman, Derek Hendry.

New illustrations are to be added regularly. All illustrations are provided with an explanation to put the clause and illustration in a context to best understand and discuss the clause. An explanation of the clauses meaning is then provided and then followed with an illustration.

"A significant number of clauses depicted in BCA Illustrated have multiple 'issues/ explanations/illustrations' to allow for the various applications of a clause in differing building circumstances and of course due to different interpretations of a clause in different states."

BCA Illustrated has an extremely fast search function, allows for printing of individual clauses; pages and illustrations and also offers illustrations which depict compliant and non-compliant situations.

"We see BCA Illustrated raising the bar, allowing users to take a giant step forward in their appreciation and understanding of the BCA from the illustrations prepared by building surveyors around Australia who interpret regulations for the issuing of building approval."

BCA Illustrated is available for a free 5 day trial at www.bcaillustrated.com.au for users to experience the product.

STI Call Point (Re)Sets the Standard in Hong Kong

A somewhat unusual problem with condensation in a major Hong Kong commercial building has been resolved by the ReSet Call Point from STI (Europe) and a little lateral thinking from a resourceful fire safety engineering manager.

The China Resource Building, a 178 metre tall skyscraper in the Wan Chai district of Hong Kong island, was experiencing regular faults in its fire detection and alarm system. Peak Trade International Limited (PTI), a company that has been providing fire system design, engineering and maintenance in the Asian market for some six years, was called in to investigate. Kinman Chow, Engineering Manager with PTI, soon identified the problem. The breakglass call points in the public corridors on each of the building's 48 floors were semi-flush mounted. On completion of the day's activities, to conserve energy the air conditioning system is shutdown, with the resulting change in temperature generating condensation which was running down the wall and entering the call point. This was causing a fault report in the system, a problem which resolved itself during the day when the air conditioning was reactivated and the water that had collected in the call point's back box dried up. Mr Chow comments – "We conducted a full risk assessment for the China Resource Building. The faults were only occurring at night when the air conditioning system was shut off and the risk in terms of life safety was therefore low. However, we all know that fire safety is not just about protecting life but also the building itself, as well as its contents. From our risk assessment we recognised the need to do something to resolve this issue to ensure the building's owners had a fire protection system that was fully operational 24 hours a day."

Following the site survey, PTI recommended that the existing call points be replaced with STI's ReSet Call Point and an Apollo mini module (located in the Air Handling Unit plant room) to interface with the Apollo analogue addressable fire detection system. The 'ReSet' mimics the feel of breaking glass but in a unit which offers the benefits and environmental advantages of a re-settable operating element. Although it is flush mounted, the call point's screw-type terminal is much less susceptible to water ingress than the plug and play design of the units that had caused



problems. Even though a waterproof ReSet call point manufactured to IP67 ratings is available as part of the range, the manufacturing quality of the indoor version proved more than adequate to overcome the condensation problems encountered in this particular application.

This approach also resolved the situation with the call point located in the podium at upper ground floor level which could be affected by rain, particularly when the rain was coupled with high winds.

Since the introduction of the ReSet Call Point, the faults in the system have been completely eradicated. Mr Chow continues – "although the call point we used is recommended for use indoors, the build quality meant that it was able to resist the condensation in this application and the call points located in the public corridors have worked perfectly since being installed. Also, no false alarms or fault reports have been generated by the call point in the podium, despite sometimes typhoon conditions, which is a real testament to how robust the units are."

The success of the initial project and the positive response from the building's owners to the performance of the units has led to a second phase where the remaining existing call points are being replaced with the STI ReSet.

The ReSet call point is manufactured to EN54-11 and approved by LPCB.



For more information, please contact:

**Safety Technology
International (Europe) Ltd.**
Unit 49G Pipers Road
Park Farm Industrial Estate
Redditch
Worcestershire B98 0HU
England
Tel: +44(0) 1527 520 999
Fax: +44 (0) 1527 501 999
Email: sales@sti-europe.com
Website: www.sti-europe.com



ONLY FIRETRACE IS FIRETRACE

OTHER TUBE-BASED SYSTEMS
CLAIM TO BE LIKE FIRETRACE.
THEY ARE NOT.

- + Only FIRETRACE INTERNATIONAL Systems offer the extensively tested Firetrace brand solutions with listings and approvals[†] from CE, FM, UL, ULC and more than 25 other international agencies on agents such as Dupont FM-200, 3M Novec 1230, CO₂, and ABC dry chemical.[†]
- + Only FIRETRACE INTERNATIONAL has 20 years of experience with more than 65,000 systems protecting equipment worldwide.
- + Only Genuine FIRETRACE SYSTEMS have the tested and proven reliability you and your customers require.

Never compromise your reputation by using impostor, untested and unapproved systems – be sure you are using genuine Firetrace.

FIRETRACE®
AUTOMATIC FIRE SUPPRESSION SYSTEMS

Call +44 (0) 1293 780390 (Europe, Middle East, Africa) or
+1 480 607 1218 (US and elsewhere) or e-mail info@firetrace.com
to see why Firetrace is the right solution for your fire protection needs.

www.firetrace.com
www.firetrace.eu



Firetrace® is a registered trademark of Firetrace USA, LLC / Firetrace Ltd. All unauthorized uses of the Firetrace trademark shall be prosecuted to the fullest extent permitted by the law.

[†] Listings and Approvals vary by system and agent.

**INSIST ON GENUINE
FIRETRACE SYSTEMS
FOR PROVEN FIRE
SUPPRESSION**



ANSUL® RED LINE® Extinguishers:

Dependable Solutions for Tough Hazards

When it comes to fire hazards, the slightest mishap in a volatile environment could result in an inferno within a matter of seconds. Highly susceptible industries such as chemical, petro-chemical, mining, and oil and gas, all face the risk of potentially devastating fire hazards on a day to day basis.

Without ready protection on hand, the time taken to extinguish a fire could well prove costly in these tightly-contained, highly-combustible locales. On top of crippling casualties to high-value assets and infrastructure, such ignitions also hold substantial risk for numerous lives and livelihoods.

Made by professionals, for professionals

Tyco Fire Suppression & Building Product's ANSUL brand has a well-deserved reputation as the world's leading name in fire protection systems. The ANSUL brand consists of both visionary innovation and technological excellence. No matter the industry, extensive range of ANSUL state-of-the-art equipment ensures that fires are quickly detected and suppressed in event of an accident.

ANSUL RED LINE hand portable fire extinguishers are no exception to the brand's dedication to comprehensive fire protection solutions. Manufactured with only the finest materials, each design is tested and retested under actual fire situations to ensure every component is made to the highest standards possible. The result is equipment that the professionals trust to perform better, last longer, and to offer more value than any other brand.

Durable, dependable performance at the ready

ANSUL® RED LINE cartridge-operated extinguishers are the preferred premium firefighting units in high fire-risk industries. Externally-mounted pressure cartridges on each RED LINE unit ensure easy removal for increased reliability, on-the-spot recharge and ease of service. That makes it possible to fight a fire, recharge, and return to the fire – all in minutes.

Designed to withstand rough treatment year after year, all RED LINE units feature sturdy carbon steel shells that resist impact, vibration and corrosion. Special polyester powder paints provide superior protection against corrosion, cracking and chipping, and a 12-year limited warranty further ensures that all ANSUL RED LINE products are built to last.

Given that no two fires are exactly the same, all RED LINE units are also fully customizable to suit individual needs, with options ranging from High Flow to Ring Pin models, as well as agents available for every class of fire.

ANSUL's RED LINE range of extinguishers carries the same degree of excellence represented by the ANSUL brand. On top of the brand's rock-solid reputation for reducing threats of injury, protect-



ing property and ensuring business continuity, the entire RED LINE range is designed to be serviced only by authorised ANSUL distributors to keep them performing at their very best. Authorized ANSUL distributors receive the very latest training and technical information so you know you are backed by industry-leading professionals.

Model 10

Designed for high fire-frequency areas where light or ordinary fire hazards exist. Ideal for remote locations where smaller fires occur and on-the-spot recharging is necessary. Typical applications: Trucks, production line machinery, paint lockers and mining equipment.

Model 20

For use against larger fires in high-risk areas. Typical applications: Dip tanks, storage drums, oil pumping stations, turbines and compressors, quench tanks and large industrial applications.

Model 30

Recommend wherever large, intense fires often occur, and maximum fire-suppression power is needed. Typical applications: Warehouses, paint-mixing areas, fuel loading racks, fuel storage locations and heavy construction sites.

APF



by Tyco Fire Suppression & Building Products

For more information, please contact:

Tyco Fire Suppression & Building Products – Asia Pacific

2 Serangoon North Avenue 5
#07-01 Fu Yu Building
Singapore 554911
Tel: +65 6577 4360
Fax: +65 6481 8791
Email: sales-ap@tycofp.com
Website: www.ansul.com

Cutters Edge® MULTI-CUT® FIRE RESCUE SAWS

Cut Anything!

CUTTERS EDGE® gasoline powered MULTI-CUT® FIRE RESCUE SAWS
are built stronger to work harder and operate longer
in the most extreme fire and rescue conditions

CE735R MULTI-CUT® ROTARY RESCUE SAW



The CUTTERS EDGE® MULTI-CUT® ROTARY RESCUE SAW has a Hemispherical Head Piston and High Torque Gear Ratio for maximum power. Its BLACK DIAMOND™ Cutting Disc will **cut any material** - metal, concrete, composites, plastics, bullet-proof glass...ETC. And just one BLACK DIAMOND™ Cutting Disc can last as long as 100 other blades!



CE101C CONCRETE CUTTING CHAINSAW



This CONCRETE CUTTING CHAINSAW cuts 16-inches (40cm) of reinforced concrete. Its GCP SealPro® Diamond Chain is lubricated and cooled with water so there is no dust.



MULTI-CUT® FIRE RESCUE CHAINSAW



The MULTI-CUT® FIRE RESCUE CHAINSAW has a Guard to protect the operator and the Carbide BULLET® Chain cuts more types of materials, stays sharp and will last longer than any other chain!



All MULTI-CUT® FIRE RESCUE SAWS are available in a custom Aluminum Box that includes all accessories, tools and spare parts to get the job done at any emergency.



MULTI-CUT® Rotary Rescue Saw Kit



Concrete Cutting Chainsaw Kit



MULTI-CUT® Fire Rescue Saw Kit

Tele: +1-(541) 524-9999 • Email: info@cuttersedge.com • www.cuttersedge.com

Visit us at FDIC • Booth #8970 • Lucas Oil Stadium

Cutters Edge®
FIRE RESCUE SAWS

ECOPOL – Synthetic AR-Foam Fluorine-Free

100% BIODEGRADABLE

Use at 3%*

Efficient on **hydrocarbon fires**
and **polar solvents fires**

*concentration of use can be adapted on special solvents

PERFORMANCE

ECOPOL is your eco-friendly efficient answer.

Certificates & conformities

- European Standards: EN 1568 1-2-3-4
- Oil Industry: LASTFIRE – GESIP
- Marine: VERITAS
- High Expansion: APSAD R12
- Nuclear Industry (PMUC)
- Aviation: ICAO level B

Application

- Usable in Low, Medium and High expansion
- Usable with portable equipment and in fixed installations (sprinklers deluge, foam chambers, high expansion flooding, ...)

They have made the choice for ECOPOL

Recognized names of oil, chemical, pharmacy, nuclear, marine, aviation, fire brigades....

ENVIRONMENT

« European Law published on 20/12/2006 forbids the use of products containing fluorinated materials like PFOS. All available AFFF are now made with fluoro compounds based on telomer process of a different kind (example: PFOA, PFHxA...). Numerous studies are actually undertaken to assess the impact of these fluoro compounds on environment and on public health. US environment Agency (EPA) has already classified PFOA as carcinogenic. »

We consider that 1 ton of AFFF contains up to 10 Kgs of fluoro surfactants (PFS) which can contaminate persistently 2 million of m³ of water. Less than 30 years after the creation of AFFFs (1970), we can find these fluorocompounds (PFC) in all blood samples in all kind of living



beings worldwide, including polar bears, up to a concentration with a level of concern.

For Bio-Ex, we are convinced of the toxicity of all perfluoro compounds, that is the reason why we have been developing ECOPOL, AR-Foam totally fluorine-free, able to replace AFFF and combining ENVIRONMENT RESPECT & HIGH PERFORMANCE.

ECOPOL has equal or better performance than most AFFF foams, when tested to the oil industry fire test known as "LASTFIRE"

ECOPOL is formulated with a renewable natural foaming basis: coprah fatty acids (coco/palm oil) origin 100% NATURAL.

ECOPOL is 100% BIODEGRADABLE, after its shelf life is gone, it can be digested in a water treatment plant without need of incineration.

ECOPOL does not pollute groundwater.

ECOPOL matches the requirement for standard ISO 14001 and is classified WGK1 (Water Pollution Class) by the Hygiene Institut of Gelsenkirchen, Germany.

APF



For more information, please contact:

bio-ex s.a.s.

Z.I. La Petite Olivière

69770 Montrottier, France

Tel: +33 (0)4 74 70 23 81

Fax: +33 (0)4 74 70 23 94

Website: www.bio-ex.com



Say goodbye to broken glass!

EN54-11
APPROVED
PRODUCT

- EN54-11 approved (cert. no. 653a/02)
- Resettable – no broken glass
- IP67 EN54-11 Waterproof & addressable versions available



Just
ReSet

Reduce cost and time with the Stopper® Line



ALERT POINT
stand alone alarm
system. Ideal for
construction sites and
small premises



STOPPER®
prevents false
alarms



EXIT STOPPER®
prevents unauthorised
exits/entries



EXTINGUISHER STOPPER®
prevents extinguisher misuse



STEEL WEB STOPPER®
prevents detector misuse



POLYCARBONATE ENCLOSURES/ CABINETS
protects equipment from extreme conditions

NOW
AVAILABLE
WITH AIRCON
AND/OR HEATER
FACILITY
(SELECTED MODELS)

Safety Technology International (Europe) Ltd

Unit 49G Pipers Road, Park Farm Industrial Estate, Redditch, Worcestershire, B98 0HU England

Tel: +44 (0) 1527 520999 Fax: +44 (0) 1527 501999

Email: info@sti-europe.com Website: www.sti-europe.com



Patent No.: 2 406 717 / 2 430 554

Global Manufacturers and Distributors of The Stopper® Line



1 Ton
of AFFF
=
10 kg
of fluorosurfactants (PFC)
=
2 Million M3
of contaminated water



FLUORINE FREE Foam
The alternative

www.bio-ex.com

GB Solo - S2 Personal camera

The improvement in technology meant that thermal imaging cameras (tics) have been manufactured smaller, lighter with better balance either in the hand or hands free and this technology has also aided the introduction of more tics around the world due to reduced costs to the client. It has also meant that the technology on board has given rise to more uses for the tic than 'just' a search and rescue tool.

Tics are being used more and more in aftermath appraisal for inspections of affected property and neighbouring houses which may have been affected by more than just smoke damage. These inspections have helped to develop and evolve the technology further in to tics with telemetry.

Tics now having the ability to record and download digital quality pictures – some units can even store up to 40,000 images – the usefulness of a tic extends beyond the fire ground and into the forensic field. With the use of pictures taken shortly after a fire had been controlled, the forensic team can begin to gather information crucial to determining the cause, tics can register temperature differences down to 0.01degrees and as such can determine much more than the naked eye.

The use of image storage will soon be superseded with video recording capabilities with the image being viewed and recorded real time via wireless transmission/recording systems.

Optional Built in Transmitters operating in the 2.30 – 2.45 Ghz frequencies are available together with a range of receiver stations. The use of wireless transmission systems is nothing revolutionary to the tic industry but the capability to record these images on to the camera similar to a domestic digital camera is.

Another useful development is the capability for the tic to record and store useful information. Labelled as '**mission profiling**' the camera has the capability to measure and record usage duration, temperature monitoring including highest temperature reached giving useful feedback to operatives and this can be especially useful for training grounds.

Single button operation is evident the majority of tics, however, with single button operation comes certain restrictions of use as the individual button has to cope with over five various functions from zoom feature through to colour invert. The NFPA1801 standard on thermal imagers for the fire service requires more than one button operation for imagers with 'features, so any imager with telemetry which can and is utilised within an operative procedure will require more than one operational button. A regulation which should further develop the use of tics operationally.

Whilst the technology of tics has developed rapidly within the fire market there will be a plateau at which the on screen definition can be improved further or the information download become too 'technology' based to be useful for fire fighters.

There has to an extent been a slow down in the technology release/update for fire tics with engineers 'polishing' the products rather than the technology explosion seen in the early and then late nineties and then the turn of the millennium.



S2 Personal

The S2 Personal is the World's smallest, lightest hand held camera of its kind weighing only 1.2lbs (600g) and still manages to utilise a widescreen 3.5 inch OLED display. The OLED feature of the display offers sharper, brighter image definition than a standard LCD display as found in many hand held imagers. Using SOLO's own 160x120 resolution core, the clarity, contrast and image perception out performs other higher resolution cameras currently on the market, this is in part due to the OLED's capability but more to SOLO's high dynamic range software. One criteria from the beginning of the design process was that low cost does not mean low quality.

The spec level is factory fixed with spot temperature, battery gauge, single colour map and zoom all as standard features.

The higher end specs include up to four colour maps, colour invert, ambient temp, video capture and picture capture on top of all the standard features.

One feature carried over from earlier SOLO models is the on board telemetry. All SOLO cameras begin recording from the time they are activated to shut down. They record up to fifteen missions and hold information such as duration of operations through to temperatures exposed to, for how long at a certain temperature etc.

This is useful within active service but highly valuable as a complementary aid on the training ground. Connecting to a computer the information is displayed using SOLO's intuitive software; the telemetry information can be accessed and compared in real time against screen shot images taken on the mission. Assessing the complete mission in the form of temperature monitoring with a graphical and pictorial guide gives the user further information with which to implement any necessary operational enhancements.

APF

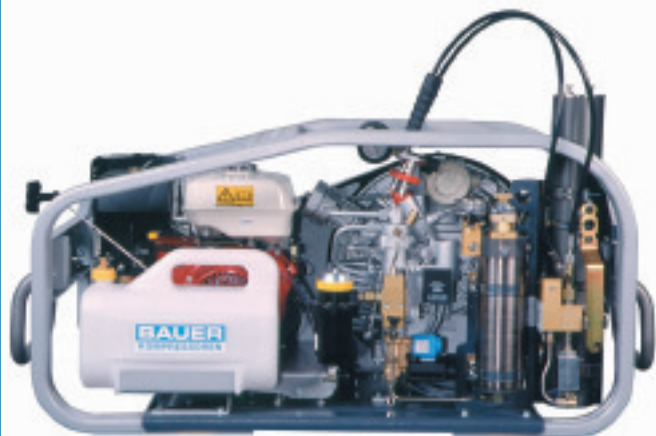
For more information, please
contact:
GB Solo Ltd.
Website: www.gbsolo.co.uk

BAUER COMPRESSORS



Verticus 5 /KAP 5 stationary compressor

The most advance modular unit system used in fire stations with SPC-compressor control B-CONTROL, P Filter System and integrated filling panel. The unit can be upgraded to a silenced unit VERTICUS 5 type and additional filter housings, refrigeration dryer AIR-KOOL, external filling panels as well as storage cylinders can be easily fitted.



Mariner 250/320

The power pack for larger delivery of air, 250l/m and 320l/min. A newly developed, super-light aluminium chassis guarantees the best protection against corrosion! Inter- and after coolers made of stainless steel resist the toughest climatic conditions. The construction of the motor rocker stand reduces vibration for smooth operation as well as self-tensioning of the v-belt drive.

BAUER offers only Independently Tested Containment Fill Stations which were found to protect the operator from overpressure and fragmentation per NFPA 1901.

Containment Fill Stations – Stationary & Mobile

High-Pressure Breathing Air Compressors and
Auxiliary Equipment
Worldwide Sales and Service Network

BAUER COMPRESSORS ASIA PTE LTD

2 Penjuru Place, #01-05 Penjuru Tech Hub, 608783 Singapore

Tel: +(65) 6271 6271

Fax: +(65) 6272 3345

<http://www.baugroup.com>

Email: info@bauer-compressors.com.sg



DIN EN 9001

GB SOLO LIMITED

Fire fighting helmets and
thermal imaging cameras

S2 FIRE INTEGRATED

**The smallest and lightest
fire fighting TIC in the world**

Weighing only 600g with the ability to adapt the camera to suit individual requirements, the **S2 Fire Integrated** takes hand held and hands free technology even further.

- Weighing only 600g.
- Suitable for use with all known breathing apparatus and gas masks.
- On Screen Temperature Display, both graphic and digital.
- On Screen Temperature Warnings.



S2 SEARCH & RESCUE INTEGRATED

**Our cutting-edge
technology brings you
the smallest long range
imager available today.**

The **S2 Search & Rescue Integrated** is water resistant and vibration proof. It gives clear man detection up to 1Km & vessel identity over several km's.



- Weighing only 600g.
- As an all round camera with the capability to monitor for 'man overboard'.
- Give vessel security and identify objects over long ranges is second to none.

don't go it alone go with solo

For our **Future Developments**
please visit **www.gbsolo.co.uk**

For full details or to arrange a demonstration contact -
GB Solo Ltd. Tel: +44 (0)1609 881855
email: sales@gbsolo.co.uk • www.gbsolo.co.uk



*(formerly known as
Pacific Helmets Australia)*

Emergency Products for Critical Situations

MAJOR DISTRIBUTOR FOR

- Bristol Fire Clothing • Pacific Helmets NZ • ESKA Gloves
- Hot Stick USA • ESS Goggles • Kappler Chemical Suits
- Aqua Fast Pumps • Argus 4 Thermal Imaging Cameras
 - Eflare Beacons • Lifeline Flash Hoods
- Kestrel Weather Meters • Air Boss Defense Boots
 - UKE Torches and Accessories
- Quick Fist One Piece Clamps • Ventry PPV Fans
- Preco Environment Waste Spill Control Products

PHONE: +61 7 3441 7100

FAX: + 61 7 3441 7177

www.pacfire.com.au • sales@pacfire.com.au

HEAD OFFICE QLD

Unit 1, 28 Burnside Road
Hallmarc Business Park
YATALA QUEENSLAND 4207
AUSTRALIA

A fire expert's personal plea

The author's in-depth Santika report helps spur a government to action



Pichaya Chantranuwat is vice chairman of the Disaster Study, Research, and Development Committee for the National Safety Council of Thailand (NSCT), and is a member of the Technical Committee on Fundamentals of Life Safety and Means of Egress for the 2009 edition of NFPA 101®, *Life Safety Code®*. He is also managing director of Fusion Fire Safety Co., Ltd., a consulting firm in Bangkok.

This article is based on a report on the Santika fire that Chantranuwat prepared for the NSCT. The report examined in detail the underlying factors that resulted in significant loss of life in the fire, including occupant capacity, means of egress, and the building's design and materials. Based on his findings, Chantranuwat's report included a lengthy list of recommendations for improving fire safety in Thailand, including the adoption of NFPA codes and standards and a more organized, disciplined approach to enforcement.

Based on his report, and on his personal plea that fire safety be given more regulatory attention throughout the country, the Thai government is currently advocating for regulations designed to improve fire safety in entertainment venues. Chantranuwat and other supporters are hoping that those efforts can be turned into law sometime in 2010.



Remembering Santika

One year after a deadly nightclub fire killed 66 in Bangkok, a Thai fire expert continues to call for stricter fire-safety regulations based on NFPA codes and standards – and for a national will to enforce them

PLUS NFPA experts discuss the global threat of nightclub fires in the wake of the *Lame Horse* blaze in Perm, Russia

By Pichaya Chantranuwat Managing director, Fusion Fire Safety Co., Ltd.

In the early minutes of January 1, 2009, more than 1,000 people were packed into a nightclub in Bangkok called the Santika Pub. Most were young Thais, but there were also revelers from around the world, including the United States and Europe, who were drawn to the club for its reputation as one of the hottest nightspots in the city. The attractive space featured a large main-floor dance area, a stage, and mezzanine sections that overlooked the dance floor. The New Year's Eve celebration was called "Goodbye Santika," because the owners of the club were planning to close the facility and reopen in a new location. The featured band for the "Goodbye Santika" event was a popular group called Burn.

Shortly after midnight, Burn was performing onstage. The dance floor was filled with people, many of whom photographed the band with cell phones. As part of Burn's act, pyrotechnics were lit; sparks shot toward the ceiling. A video of the event, shot with a digital video camera found at the scene, shows the pyrotechnics going off; moments later, at about 12:15 a.m., sparks begin

to fall back down from the ceiling, landing around the stage. Over the next minute or so, the video shows the singers for Burn, as well as people in the audience, looking up at the ceiling frequently as the falling sparks grow larger and more numerous. In the next minute, larger pieces of flaming material fall from the ceiling as the fire at the ceiling level grows.

The fire was first reported to the Thong Lor Police Station at 12:20 a.m. The city's fire rescue center, Rama Center, however, did not receive a call until 12:40 a.m. Two fire trucks from Phra Khanong and Bangkapi fire stations, located about 2.5 km from Santika, struggled through heavy traffic and arrived at the club at 12:48 a.m.

In the 28 minutes that elapsed from the time of the first call until firefighters arrived on the scene, fire engulfed the building. People inside made desperate attempts to get to one of the building's four exits. The electricity failed and the lights went out, making escape even more difficult. More than 400 people tried to descend from the club's mezzanine sections, worsening the situation at the



already-crowded main entrance. As the smoke and flame intensified, and as large metal pieces began to fall from the ceiling, people diverted their escape attempts away from the main exit to the windows, the back doors, and the basement. People succumbed to the smoke and high levels of toxic gases. A large circular steel bar holding stage lighting and connected to the building's roof structure collapsed, pulling a large portion of the roof down with it. Fumes and smoke escaped through the hole, but the sudden rush of air from the outside also intensified the flames inside.

As emergency workers tended to the injured, firefighters fought the blaze and attempted to rescue more people from inside. Additional firefighters arrived on the scene; 120 firefighters were joined by numerous volunteers and local police, until the rescue effort numbered more than 200 people. More than 80 vehicles were on the scene, including 50 fully equipped fire trucks. The blaze was brought under control at 1:15 a.m., and was extinguished at 1:30 a.m.

As the night went on, it became clear the fire had taken a terrible toll as body after body was removed from the charred remains of the building. In all, 55 people died at the scene, and another 11 died en route to or at local hospitals. Another 229 were injured. It was the worst nightclub fire in Thailand's history, and the seventh-worst international nightclub fire on record, a list that now

includes the *Lame Horse* nightclub fire that occurred in Russia in December (see "The Global Nightclub Problem," page 49).

The Santika fire, and the subsequent investigation, have alerted Thailand to the fact that there are still many potential hazards and vulnerabilities regarding fire safety in entertainment venues, from the most visible features like building construction materials and designs to the country's inadequate or lax fire safety regulations and policies. It may be a turning point; in response to Santika, the Thai government has called for the national adoption and enforcement of fire-safety regulations, based on the recommendations in the NSCT report that we adopt new fire safety criteria and regulations based on the requirements in NFPA codes and standards.

Primed for a "disastrous outcome"

A police investigation concluded that the fire started when pyrotechnics shot from the club's stage ignited a blaze on the club's ceiling. A closer look at the building and the situation inside the club on the night of the fire show that conditions existed for a disastrous outcome in the event of a fire.

The three-level building included a ground floor with a main assembly hall of 306 square meters, a mezzanine with 236 square meters, and a 128-square-meter VIP room separated from the main assembly hall. There was also a small sub-

basement where the bathrooms were located. Based on square-footage capacity guidelines in NFPA 101®, *Life Safety Code*®, Santika's main floor could accommodate a maximum of 898 occupants. For the "Goodbye Santika" event, eye-witnesses estimated the crowd to be at least 1,200, far more than would be considered safe in countries where regulations exist to limit the number of people that can safely occupy a building.

The building had only one main entrance, located at the front. The widest opening of the door was slightly more than 2 meters. There was also another door at the side of the building, which opened both in and out. There was an entrance at the back of the building, which opened to a hallway that led to the main assembly hall. There were two double doorways in the hallway: one located near the back entrance, and a second, slightly narrower door located closer to the main hall. That door opened inward, opposite the direction of an emergency evacuation and a fundamental violation for egress doors in assembly occupancies.

There were not enough fire exits, and those exits were not designed with sufficient capacity, to facilitate the evacuation. There were also no regulations to force business operators, architects, or engineers to comply with the guidelines set forth in NFPA 101. According to NFPA 101 requirements, the main front entrance should have been more than 3 meters wide and sized to accommodate two-thirds of the allowable occupant load. Computer egress modeling showed that the

estimated time for a complete evacuation under normal circumstances would be about nine minutes. This process would involve a long queue of people waiting to leave the building via the main exit, given the width of that exit. The primary exit became a trap; 32 of the 55 people who died inside the building were found just inside the main entrance.

The building that housed Santika was mostly made of steel. The ground floor was concrete construction, and the exterior walls were built with bricks. The truss-style roof structure was made of steel. There was no principal column in the main assembly hall, but rather a number of supporting columns that were partly covered by decorative fiberglass resin. The building's windows and doors, with curved steel frames attached, were made with either plain or filmed glass.

A number of materials in the building were highly combustible. The metal roof was insulated with a combustible cellulose-like product, which likely provided the fire's first fuel package. Sound proofing was provided by flexible foams made of polystyrene and polyurethane, each of which possesses thermal energy rivaling that of burning gasoline. Parts of the inner walls were also decorated with brick-shaped fiberglass resin and sponge-based padding, both highly combustible. The floors, walls, and ceilings of the mezzanine sections were covered with plywood sheets. It is likely that many people lost consciousness due to the toxic gases and smoke released by these materials, and eventually succumbed to the lethal mix

Rescue equipment



PowerShore™:
the power to save lives.

PowerShore™ is not your average emergency shoring system.

It is also available with integrated hydraulic cylinders for use in heavy lifting operations.

PowerShore™ is the perfect choice if you want to use only one system for every rescue situation.

www.holmatro.com

Holmatro Rescue Equipment BV | The Netherlands
T +31 (0)162-589200 | F +31 (0)162-522482 | E rescue@holmatro.com

holmatro
mastering power

The enforcement problem

Much of the public outcry in the wake of the Santika fire has focused on the absence of inspection and enforcement of public buildings in Thailand, especially nightclubs. A 2007 law requires all public buildings, including bars and nightclubs, to undergo safety inspections. The BBC reported in April that of the 6,000 public buildings in Bangkok, about 3,000 had been inspected – but none were bars or nightclubs, and only 200 of the buildings inspected had passed.

"If you go to a nightclub in Bangkok, and you want to be safe, always check where the exit is, and stay close to it," a representative from the Engineering Institute of Thailand told the BBC.

According to press reports, a Ministry of Justice investigation found that Santika was licensed as a private residence rather than a club, and had therefore undergone no fire safety inspections. The BBC reported that police filed 47 charges of operating illegally against the club from 2004 to 2006, whereupon the charges abruptly stopped; it also reported that a senior police officer was a shareholder in the club, and was clearly listed as such in company documents.

Also fueling public anger is the apparent difficulty on the part of law enforcement to hold anyone accountable for the fire. The Bangkok Post reported in October that police were recommending indictments for seven people, including club owners and managers, along with a singer from the band Burn, whose act included the fireworks that police determined were responsible for the blaze. So far, no arrests have been made. A number of civil lawsuits have been filed against the owners of the club by survivors of the fire, as well as by the families of people who died.

In June 2009, NFPA signed a memorandum of understanding (MOU) with The Bangkok Metropolitan Council of the Kingdom of Thailand. The MOU program, NFPA's leading international initiative, sets in place mechanisms to strengthen new and existing collaborations to promote the knowledge of fire, electrical, and life-safety standards in countries around the world. Through this particular MOU, NFPA will collaborate with the Bangkok Metropolitan Council to develop guidelines used for enacting fire-protection laws in Bangkok. Specific assembly occupancies were listed, including entertainment facilities, malls, theaters, and sports arenas. For more information on NFPA's MOU programs, visit www.nfpa.org/international.

that resulted from the products of combustion.

The situation inside the burning club was made worse by obstructions, including tables, chairs, and other items blocking the means of egress and the access to the exit doors. There were no fire exit signs, and no emergency lights, except for one in front of the kitchen area. There was no fire alarm system, and no sprinklers. There were three hand-held fire extinguishers, two of which were later discovered unused.

Away from the venue, communication between concerned parties was poor. Eyewitnesses did not report the fire to the fire rescue center, Rama



Center, with its "199" hotline; instead, they called the Thonglor Police Station. The fire service was not notified of the fire until 20 minutes after it had been first reported, and it took another eight minutes to get crews to the site, a result of heavy New Year's Eve traffic. Firefighters arriving at the scene said they could not reach it immediately because of the taxis parked in front of the building, and because of the number of people who had escaped the burning club and were attempting to drive their cars out of the parking lot.

In general, the problems that firefighters and rescue personnel faced were problems common to emergency situations in Thailand. The personnel and equipment that first reached the scene were inadequate and deployed inefficiently, and the overall effort was poorly coordinated; the approximately 20-minute delay in notifying the fire department is itself a major cause for concern. The first firefighters at the scene did not have the proper personal protective equipment, nor did they have self-contained breathing apparatus. Such equipment is necessary to allow the firefighters to gain entrance to the structure, commence any firefighting actions, and attempt the rescue of any occupants who would still need to be brought out of the building. They also had to help rescue workers move victims to waiting ambulances, which were about 100 meters away. Despite the difficulties they encountered at the scene, rescue workers managed to save a number of people with cardiopulmonary resuscitation.

Avoiding future Santikas

The fire-safety problems that exist in Thailand, a nation of more than 66 million people, are not the responsibility of any single group or authority. It is up to many different stakeholders to ensure this kind of disaster never happens again.

Business owners need to be critically aware of the safety management of a building. Maximum occupancy limits need to be established; the rule of no more than one person per one square meter of space – NFPA 101 allows one person per 0.65 square meter – should be rigorously enforced. Signs stating the building's capacity should be clearly displayed on the front of the structure, along with its service permit, proof of insurance,

and the names of the people in charge of the building. Rehearsals of fire evacuations, with staff leaders and crowd managers being clearly designated, should be held regularly. There should be a plan for managing traffic during an emergency. A building should also be annually inspected to ensure that basic fire safety features, such as adequate and clear/unobstructed exits and exit access paths, are maintained.

For architects, engineers, builders, and inspectors, NFPA codes should be applied in all design, construction, and permitting work. Fire alarm systems and signal transmissions to a fire station should be installed following NFPA 72®, *National Fire Alarm and Signaling Code*®; automatic sprinkler systems should be required to be designed and installed in accordance with NFPA 13, *Installation of Sprinkler Systems*; and smoke control and ventilation systems should be installed following NFPA 92B, *Smoke Management Systems in Malls, Atria, and Large Spaces*. In accordance with NFPA 101, all buildings should include exit signs and emergency lighting. Building construction type and materials should be fire resistive or non-combustible in accordance with NFPA 5000, *Building Construction and Safety Code*; glass materials and glazing should be safety rated. Any sound-proof insulation materials should be flame retardant and covered with gypsum boards or other noncombustible material if necessary. NFPA 101 also needs to be followed to determine the proper number, width, and distribution of exits.

Policy makers and government officials should undertake a number of short- and long-term efforts. Most immediately, they should strictly adhere to the guidelines set forth in the National Fire Safety development master plan. They should strictly enforce the Building Control Act, and develop new regulations with the help of the Council of Engineers. The "199" fire emergency hotline should be publicized more widely, and a new information center regarding fire safety should be established. More training resources should be developed and offered for nightclub staff and business operators. Specifically, any such training needs to outline the responsibilities of the trained crowd managers. Fire and rescue communications should be improved so that personnel can reach an incident within eight minutes of its being reported. Finally, a committee should be established to study the Santika incident and develop a plan to respond to and implement the recommendations made in the various investigative reports.

Longer term, a new National Fire-Safety Committee should be formed to assess fire safety in certain kinds of buildings. A national fire-safety institute should be established, along with a model fire station to help us develop greater efficiencies in both the notification and response to any emergency incident. Thailand's databases regarding fire incidents and fire safety should be overhauled. A rigorous national building code should be implemented as soon as possible, and building inspection regulations should be amended to focus more on practical fire-safety measures during the use of a building.

Change is already beginning to happen. Thailand's Department of Public Works, along with the Ministry of the Interior's Town & Country Planning, are pushing for a new fire-safety regulation for entertainment venues. The regulation out-

The global nightclub problem

As it did at Santika, and as it did at The Station nightclub fire in Rhode Island that killed 100 in 2003, the combination of pyrotechnics and a crowded club has again proved lethal.

As this issue was going to press, the story of the Lame Horse club in Perm, Russia, was criss-crossing the globe. A party at the club on Dec. 5 included a pyrotechnics display, which apparently ignited a plastic ceiling decorated with tree branches. Hundreds of people attempted to escape through the building's single exit. At last count, 150 people had died, and more than 130 were injured, many in critical condition. The Associated Press reported that the city's regional government resigned in the wake of the blaze, and that several regional fire safety officials had been fired. According to the AP, four people, including the club owner and a pyrotechnics supplier, have been jailed pending a negligence investigation.

Olga Caledonia, executive director for global operations at NFPA, points to a lack of legislation and an insufficient "culture of safety" in many countries as reasons for the ongoing problem of nightclub fires around the world. "The story of Santika has repeated itself in just about every international nightclub tragedy over the past decade," she says. "There is a common pattern: overcrowding, highly combustible interior finishes, insufficient exits, and an absence of automatic sprinklers."

Caledonia says NFPA's efforts in Eastern Europe are through the International Association of Fire and Rescue Services, better known as CTIF. NFPA's influence has "greatly increased" in the 50 CTIF member countries, including Russia, Caledonia says. She adds that NFPA is exploring the possibility of working closer with Moscow's volunteer fire service.

Gary Keith, vice president of field operations at NFPA, says events like Santika or Lame Horse – or The Station – are proof that nightclub fires are a global problem that includes countries with comprehensive fire codes, including the United States. "In spite of the lessons learned from The Station nightclub fire and changes that were made to model code provisions, we know that the issue of use and enforcement of those provisions will require constant vigilance to minimize the risk of fire in nightclubs," Keith says. NFPA members can help minimize that risk, he says, by "supporting the adoption of NFPA model codes and standards, along with the level of enforcement necessary to affect their proper use in these venues."

No matter what hemisphere the risk is in, the best codes in the world mean nothing if they aren't implemented, says Caledonia. "Otherwise," she says, "all of NFPA's know-how and experience from the last 110 years will not have the impact that it could."

lines requirements for fire-safety measures that include installations of fire detection, alarm, and suppression systems, fire exits and signs, emergency lights, venue capacities, and fire evacuation rehearsals. Advocates hope this regulation can be adopted within the next six months.

APF

Reprinted with kind permission from NFPA Journal® January/February 2010. All rights reserved.

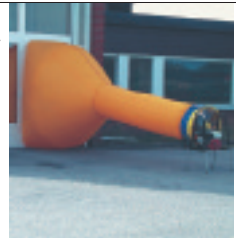
Pichaya Chantranuwat is managing director of Fusion Fire Safety Co., Ltd., a consulting firm in Bangkok

**Check them out
and you'll be surprised!**



* CHECKED BY
INTERNATIONALLY RECOGNIZED
RESEARCH LABORATORY (USA)

"Door adaptor"
for efficient
pressurisation
of adjacent areas
and also, when
producing foam,
preventing it from
running back out
of the building.



Placement on stairs

Adaptor to produce
high expansion foam.
Expansion:
1:300-800.
Foam production:
60-160m³/hr.
Water flow:
200 litres/min.
Weight: 9 kgs.



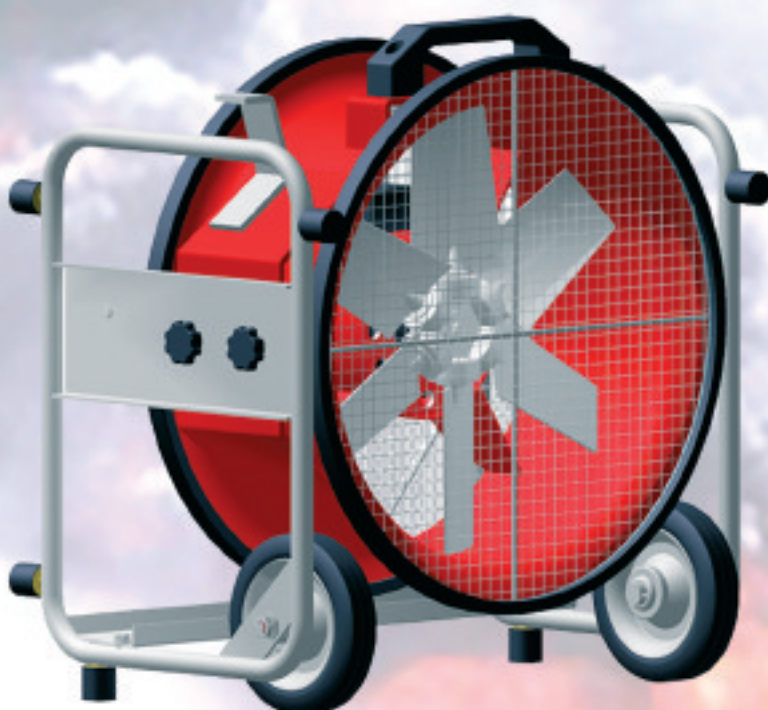
The only PPV fans with so many unique features and accessories.
Developed in close co-operation with swedish fire brigades.

Dafo Brand AB | Ph. +46 8 506 405 00 | Fax. +46 8 506 405 29 | info@dafo.se | dafo.se

dafo
fire & rescue equipment

VM 400 E

with AC-motor.
Best version for limited storing
space.



Russwurm Ventilatoren

Made in Germany

**...when mobile, compact but powerful fans are
required.**

Experienced in strongest fire and rescue situations.
Used in vehicles which have to be equipped for all
incidents. For every duty the right drive.

All versions are available with certified explosion-
proofness. We offer a wide range of ATEX-certified
fans for the zones 1, 2, 21 and 22 in axial and radial
design.

If required, they can be customized to your needs.



Get in contact with us and assure yourself of our
capabilities.



Russwurm Ventilatoren
GmbH
Ortstrasse 25
D-86405 Mettingen-Ostendorf
Phone: +49-(0) 82 71 / 81 75 - 0
Fax: +49-(0) 82 71 / 81 75 - 41
E-Mail: sales@ruwu.de
<http://www.ruwu.de>

ruwu
High-Efficiency-Fans

Centrifugal fans
Axial fans
Mobile fans
Fan impellers
Fan service

... and you have the air under control

Dafo Brand AB – a PPV fan you can use for a lot more than just moving air!

DAFO BRAND AB is the Swedish market leader for fire and rescue equipment for professional users. Dafo is also Scandinavia's only manufacturer of fans for PPV (Positive Pressure Ventilation) designed to combat fire.

There are two models in the series: SweFan 21" and SweFan 24": both combine high capacity with low weight and compact dimensions. The fans are powered by a Honda petrol engine, an easy-to-start and reliable engine with service potential all over the world.

The fans are extremely mobile, thanks to their large wheels and convenient handle. Both models have multiple tilt options in order to provide the maximum angle of the air current towards the object.

The fans and peripheral equipment are manufactured in Sweden under our own auspices, which means complete control of manufacturing and quality, as well as short delivery times in the event spare parts are needed – delivery will normally take place within 24 hours.

"We developed the SweFan fans about 15 years ago in close collaboration with the Swedish Rescue Service, which was one of the very first proactive users of PPV fans. We took experiences and wishes arising from several years' operative use into consideration. The ability to place the fan in stairways or on uneven surfaces, as well as the ability to conduct exhaust fumes away from the vicinity of the fan to avoid further contamination of the fire area, were some of the details we took into account when designing the fans. That's why SweFan 24" has 4 separately adjustable legs. Both models have a 5-metre-long, easily-attached exhaust hose available," explains Dafo's Johnny Rydén.

Dafo was the first manufacturer able to offer a high expansion foam adapter, SkumRask, for the fans, thus giving the option of using them to produce light foam or just water mist which the air current helps to penetrate further and which has a cooling effect on fire gases and radiant heat.

SweFan gives users great flexibility during an intervention and takes up less space in a vehicle compared to having both a fan and a separate high expansion foam unit on board. SkumRask can be easily attached to the fans for rapid deployment.

As the sole manufacturer of PPV fans, Dafo can also offer the unique door adapter for its products. When placed on a door frame, the room is filled by the air current from the fan and acts as an effective seal, which means that the entire air current from the fan goes into the room, increasing the atmospheric pressure within.

No air or pressure is used to seal the inlet opening, which is what happens when a fan is used without a door adapter. On numerous occasions, the door adapter has been used to effectively pressurize a room adjoining a fire area, thus preventing the spread of gases and soot into the adjoining space and this saves a lot of time and money as there is little or no need for any clean-up, ensuring residual value of the property.

The door adapter can also be used in conjunction with the SkumRask light foam attachment and it effectively prevents the foam from being pressed back out through the inlet opening by the back pressure in the fire area; the foam is pressed effectively further in and higher up in the room instead.

Even when the door adapter is inflated, it is easy to pass through the sealed opening because it is made of a soft material.

Both SweFan 21" and SweFan 24" have been capacity tested with excellent results by an internationally recognized research laboratory in the USA.

SweFan is used by virtually all Swedish Rescue Services and rescue training centres, and can be exported all over the world.

For additional information, please contact:

Dafo Brand AB
Vindkraftsvägen 8
135 70 Stockholm Tyresö
Sweden
Tel: +46 8 506 405 00
Email: info@dafo.se
Website: www.dafo.se



Euramco Safety

EURAMCO SAFETY is a San Diego, California based manufacturer of Portable Ventilation Fans that carry the RAMFAN Brand name and are used worldwide by Fire Professionals for removal of dangerous gas and smoke in fighting fires.



RAMFAN is a Ventilation Fan name recognized around the world for High performance, rugged durability, portability and low maintenance. The RAMFAN line of Fire and Confined Space Fans includes Gas, Electric and Water Powered models used in PPV, Smoke Ejection and to assure maximum safety for both workers and Rescue Professionals in dangerous, confined space

environments. Fan sizes range from 8-inch (20cm) Confined Space Blowers to 24-inch (60cm) High Volume Blowers.

RAMFAN Turbo Fan Blade Technology develops 20% more airflow velocity than standard propeller fan blades for faster, more thorough clearance of smoke and dangerous heat and toxic gas in both residential and high rise fires. RAMFAN PPV

POSITIVE PRESSURE VENTILATION FANS ROUND UP

Airflow performance numbers are tested and certified by Third Party procedures and comply with the AMCA Certified Ratings Program.

RAMFAN features a full-perimeter steel frame, a popular design, that assures maximum fan protection, fast grip portability and set-up and secure storage.

Gas powered models feature up to a 6HP Honda engine with an optional exhaust diverter and Airflow performance up to 46,750 m³/hr. Electric powered fans include up to 1.5HP motors with exclusive IntelliSense™ water resistant variable

speed control for smooth, continuous airflow adjustment. Electric powered, 16-inch Smoke Ejectors are available in a non-sparking Lexan Housing that is easy to move and can be stacked on each other for faster smoke removal and easy storage.

All RAMFAN Gas and Electric powered PPV Fans feature ONE-Step™ Tilt Adjustment, full-width retractable handles and up to 1½" (32mm) powder coated steel frames with all-terrain pneumatic tires for easy mobility and solid stability on any surface.

RAMFAN Gas and Electric PPV Fans are certified as Industry Leaders in the critical Fan set-up area known as **The Performance Zone**. Most PPV Fan set-ups are made within an area from 1 to 3 meters back from the structure opening.

Forced Ventilation (PPV) is a proven fire-ground option for rapid removal of smoke, heat and dangerous gases. With today's fires burning hotter, Fast Intervention is the key to effective ventilation and safety for firefighters.

Certified Third Party tests show RAMFAN Gas and Electric Fans generate Peak Airflow performance anywhere in this Set-Up Zone. Just put a RAMFAN Fan in the Performance Zone and turn it on, it's that easy.

RAMFAN'S UB20 Confined Space Blower is a powerful, compact ventilation fan with a corrosion-proof, dent-resistant, dual-walled Polyethylene Housing for durability and lightweight portability. This popular shape and size is perfect for



Confined Space Ventilation and Rescue applications and it features outstanding airflow performance (1,392 m³/hr). The UB20 features an in-line Quick-Couple™.

Duct Storage Canister and power options for all situations and regions, including an ATEX Certified Intrinsically Safe Housing (Shown) for maximum safety in hazardous environments.

Euramco Safety is an ISO 9000 manufacturing facility with warehouses in the US, Europe, Middle East and China.

For more information contact them at +1-619-670-9590 or visit: www.euramcosafety.com



Groupe Leader is pleased to release 2 new PPV Fans

P-HSF Underground Car Park PPV Fan

The Park Fan is an ultra-light Portable High Speed Fan (P-HSF). It has been designed to provide an appropriate and effective solution for smoke extraction in underground car parks.

Equipped with a misting system in its standard version, the Park Fan offers effective gas dilution and smoke cooling and provides additional assistance for extinguishing.

Its reduced weight – 72kg for 18 HP – gives it an unrivalled performance/manoeuvrability ratio in operation. A single fire-fighter can easily set up an effective ventilation system to fight a fire in an underground car park.

Concept:

Placing one or more Park Fan electric fans inside a smoke-filled car park in order to benefit from the air entrainment effect.

"In fire-fighting operations, there is little room for improvisation and using unwieldy products is unacceptable."



The Park Fan has been designed to have five main characteristics:

- Ultra-light weight compared to the air flow: 72 kg for a rated 30,000 m²/h air flow
- Unrivalled manoeuvrability: easily positioned by a single person.

- The Park Fan runs on an electric motor, enabling it to be placed in smoke-filled environments even when the oxygen level is reduced. This type of functioning would be impossible with a petrol or diesel engine.
- The Park Fan is positioned 4 to 5 metres inside the smoke-filled car park to use the air entrainment effect and thus double the effective ventilation flow.
- The Park Fan is equipped with spray nozzles which cool the fan continuously. In the case of positive pressure ventilation, misting is also an option.

VGD-R 150 High Volume Fan

The VGD-R 150 is an extremely manoeuvrable mobile high-volume fan. It has been designed to provide an effective smoke extraction, cooling and extinguishing solution for large volumes.

Equipped with a nozzle spraying system in

POSITIVE PRESSURE VENTILATION FANS ROUND UP

its standard version, the VGD-R 150 offers effective gas dilution and smoke cooling.

Its extremely reduced weight (650kg on trailer – 350kg in Skid version to be mounted on a vehicle) gives it an unrivalled performance/manoeuvrability ratio in operation. One to two fire-fighters can easily handle the VGD-R 150 while proceeding with their operations.

Operating safety:

In fire-fighting operations, there is little room for improvisation and equipment failure is unacceptable. That is why the VGD-R 150, using an engine intended for light aviation which has proven its reliability and sturdiness over time, incorporates three major safety systems:

- Engine starting is only possible when the Parking brake is on.
- Two-cylinder engine with dual electronic



ignition. This engine enables operation in downgraded mode: in the event of an ignition failure on a spark plug, the smoke extraction and smoke cooling operation continues whatever happens as each cylinder is equipped with two spark plugs.

- Manual starter: In the event of failure of the electrical system, the ventilation and cooling operation can be started with a manual starter.

For more information, please contact:
GROUPE LEADER

ZI des Hautes Vallées
76930 OCTEVILLE SUR MER
FRANCE

Tél: +33 (0)2 35 53 05 75

Fax: +33 (0)2 35 53 16 32

Email: info@groupe-leader.fr

Website: www.groupe-leader.com



Russwurm Ventilatoren GmbH



RUWU produces fans with welded casings for almost every industrial application. Specialized in job-oriented single-piece or small-scale production we transform your requirements into a complete product – from construction to installation.

The focal point of our program are radial fans or centrifugal fans which cover a range of 5,000 m³/h up to 600,000 m³/h volume flow in low-, middle- and high-pressure regions.

The spectrum of our centrifugal fans extends from





"It's About Firefighter Safety"



VSX - Variable Speed Blowers
GFCI and non-GFCI Compatible Units Available



TEMPEST
POWER BLOWERS
Gasoline Power Blowers



VentMaster
Cutoff Saws



VentMaster
Chain Saws



PPV
Training Systems



TEMPEST SHADOW
Smoke Machines



MVU
MOBILE VENTILATION UNIT
Mobile Ventilation Units

For information visit: www.tempest-edge.com

POSITIVE PRESSURE VENTILATION FANS ROUND UP



extremely wear-resistant versions with plated impeller blades to convey dust laden media over compression-proof fans to multi-stage fans. They are available with all kinds of casing positions and drive systems.

Other examples are:

- Hot-gas-fans for temperatures up to 900°C, with or without casing
- Double inlet fans

- Shock resistant fans
- Explosion or spark-proof fans
- Fans without casing
- Fans made of special metals
- Fans with special linings, wear and corrosion resistant

We also offer all accessories to optimize the use of your fan.

Next to these types we produce axial flow fans up to the nominal size 2240 with or without guide vane or diffusers



(volume flow 2000 – 700,000 m³/h).

Another top-product of ruwu are portable fans of the lines MWM in centrifugal style and VL in axial style. They are used for ventilation and extraction of solvent or explosive fumes and gases out of rooms, ducts, pits or tanks by coupled flexible hoses. Available with three-phase-, A.C.- or petrol motor they cover a variety of utilizations. Explosion proof models are available as well.

For more information, please contact:

Russwurm Ventilatoren GmbH

Ortsstrasse 25

D-86405 Meitingen-Ostendorf, Germany

Tel: +49 0 82 71 81 75-0

Fax: +49 0 82 71 81 75-40

Email: info@ruwu.de

Website: www.ruwu.de



Super Vac – The Ventilation Specialists

SUPER VAC is known for manufacturing the highest quality PPV blowers and Smoke Ejectors for rescue personnel for over 50 years. With powerful fans in your choice of petrol engines, electric motors, hazardous location motors, batteries, and water motors from 20 cm to 2 meters in diameter. We also manufacture rugged Rescue and Cut-Off Saws and Smoke Machines to make tough ventilation jobs a little easier.

Our portable PPV fans includes sizes from 40 cm to 80 cm in diameter, complete with full width handles and large cushion tires to easily go up stairways, curbs and cross large diameter hoses. All units feature a full roll cage design to protect the engine and shroud. The new Econo Line fans and GC engines by Honda have all of the rugged Super Vac features and can help cut some costs in a tough economy. Our VR2 Series variable speed fans provide all the power of a variable speed fan with the ability to run off GFCI circuits. Options for the PPV line include ducting, water mist for cooling, high expansion foam generators, exhaust extensions, and the innovative handle mounted light kit.

Our large PPV is the powerful SVU-50 with a big 165 Hp engine and 1.25 meter diameter carbon fiber propeller to clear large structures. The reasons customers chose the SVU-50 over the competition is more power, more airflow, in a sleek design along with robust components.

Super Vac manufactures the entire blower to maintain the utmost power and durability required for the rigors of emergency use. The heart of all these blowers is the patented cast aluminum blade. Plastic



blades don't hold up to the intense radiant heat produced during structure fires. Each blade is engineered to maximize the airflow, then precision cast, tooled, hand-balanced, and polished.

We have been factory approved by all engine manufacturers to assure you of a unit that will run in any environmental condition. Powder coating is done in-house to guarantee a perfect finish. Whether you choose the gas powered units or units powered by electricity, battery, or compressed air the Super Vac fan will run flawlessly for years to come.

All fans are then 100% test run to assure you of perfect operation from the minute they are unboxed in your station. Included with each unit at no charge is the most comprehensive training manual in the industry. Covering topics from Positive and Negative Pressure Ventilation to Confined Space and High Rise use, you can rest assured that 50 years of emergency ventilation knowledge are provided with each unit.

All Super Vac products are manufactured by employees who owe their job to emergency service customers and come with a 5 year warranty. Quality and attention to detail are a way of life in our company to match the commitment of our customers to their job.

For more information, please contact:

Super Vacuum Manufacturing Co., Inc.

P.O. box 87

Loveland

CO 80539

USA

Tel: +1 970 667 5146

Website: www.supervac.com



Tempest: 'It's About Fire Fighter Safety'

Tempest Technology Corporation's mission is the promotion of the use of air as a tool for eliminating hostile interior environments encountered by firefighters, rescue teams, industrial workers, and industrial contractors worldwide.

This mission will be accomplished by identifying opportunities where Positive Pressure Ventilation and other ventilation techniques can be applied to make a work or emergency environment safer and educating manufacturers, distributors, and end users through live demonstrations and professional training programs.

Tempest will continually improve and expand its existing product line to meet the needs of its customers in various domestic and international markets. In order to fully use the strength of its resources and worldwide distribution system, Tempest will develop strategic partnerships, add complementary product lines, and engage in private labeling agreements with other manufacturers.

Positive Pressure Ventilation = Increased Safety for Fire Fighters

Tempest Technology Corporation was founded in 1987 to develop positive pressure ventilation tools for fire fighters. The first Tempest Power Blowers were used by fire brigades in the United States to ventilate smoke and heat from burning buildings after the fire had been extinguished. By placing the blower on the outside of the structure, blowing inward, they are able to quickly remove the smoke, heat, and dangerous gases. This allows them to locate victims faster, put out the fire faster, and it creates a safer environment for fire fighters to work within.

Over the past 22 years, Tempest has successfully promoted the concept of PPV around the world and it has become an accepted fire fighting technique in many countries in Europe, Asia, the Middle East and the Americas. In many countries, positive pressure ventilation is being used for aggressive fire attack using a technique called, "Positive Pressure Attack" or PPA. Tempest has played an important role in supporting the testing and research of new positive pressure ventilation applications such as PPA.

Tempest Technology offers a wide range of gasoline and electric powered blowers to meet your specific emergency ventilation needs. Tempest blowers are available with petrol or electric motors in sizes ranging from 400mm (16") diameter to 900mm (36") diameter. Explosion proof motors are also available.

The latest addition to the Tempest line of ventilation products is the Mobile Ventilation Unit (MVU). It is a 1250mm (48") diameter fan for ventilating large structures such as highway tunnels, underground tunnel systems, and high rise buildings. It applies the principles of positive pressure ventilation on a very large scale. Capable of airflow of over 221,000 cubic meters per hour (130,000 cfm), the Tempest MVU can quickly and efficiently ventilate any large structure. The MVU can be mounted onto a truck, trailer, or skid for easily deployment to the incident scene.



For more information, please contact:
 Tempest Technology Corporation
 4708 N. Blythe Avenue, Fresno
 CA 93722, USA
 Tel: +1 559 277 7577
 Fax: +1 559 277 7579
 Email: response@tempest-edge.com
 Website: www.tempest-edge.com

TEMPEST
 TECHNOLOGY

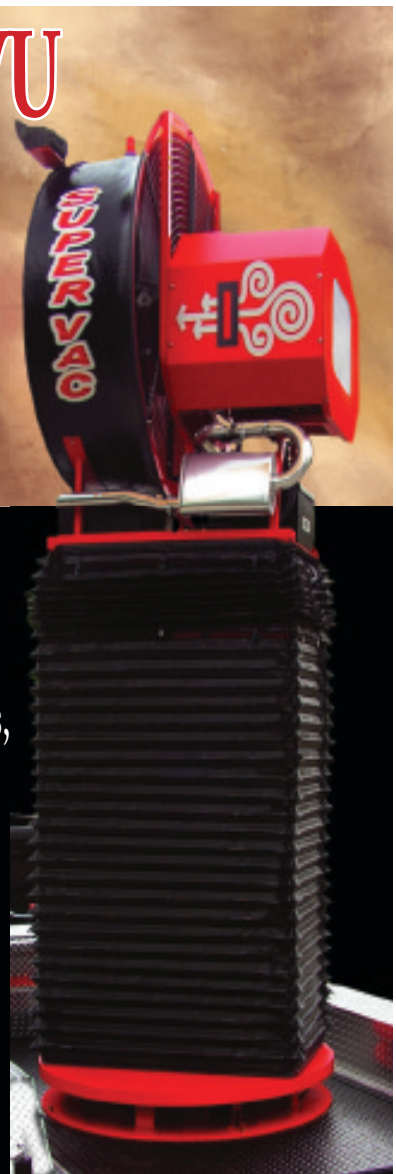
Super Vac SVU Blows Up a 425,000 cmh Windstorm!

The Super Vac SVU is useful in situations where a district includes large retail outlets, warehouses, public sites, tunnels, or airports. It can easily mount on trailers, skids, or trucks. Optional features include, lift, tilt, rotation, water misting and lighting. Contact your dealer for more details on ...

**"The Most Powerful
 PPV Available"**

 **SUPER VAC**
 THE VENTILATION SPECIALISTS

Super Vacuum Manufacturing Co., Inc. • P.O. Box 87 • Loveland, CO 80539 USA



www.supervac.com

Tel: +970 667 5146

Unifire PPV Fan Product Overview

All UNIFIRE positive pressure ventilation fans (PPV Fans) come with our rubber feet that allow the fan to be stand-alone operational. This allows the rescue team to leave the fan running where it is, without a watchman, and provides the team with one other person to assist with the rescue operation. DST series and most Du-All series PPV's come with rubber wheels, made of a compound that acts like a pneumatic tire and dissipates any vibration, instead of rear rubber feet.

The specially designed frame has a few benefits that are not at first noticeable. The lower frame, where the wheels and rubber feet are, has a specially designed arc built in. The arced lower frame is designed to allow fire house to be ran underneath and to allow the fan to stand over curbs. Along with the feet, the arc also allows the fan to be placed on stairs.

From the feet and arc we can move up to the tilt mechanism located on the DS and DST series fans. The tilt mechanism is designed for quick and easy use. The friction lock handle, the tilt mechanism, and the lower frame allow the fan to be placed in any tilted position from -10° to +20°.

All Unifire upper frames are designed to completely protect the motor from damage that may be caused by being pushed over or dropped. The frames are built with 90° angles at all corner. Since the 90° angle is the



strongest angle this gives the frame the added robustness and protects the motor further in case it is tilted over.

The specially designed fan-blade shroud also features 90° angles on all sides. This gives us added safety in the case that the fan is pushed or dropped onto its blade side. Along with the safety aspect of the shroud's 90° angles, we use an open shroud design. As opposed to a closed shroud, we are able

to entrain air from further back thus creating more air flow. Another benefit of the open shroud design is that we are able to place the fan closer to door, window, or other ventilation opening.

On the DST and most Du-All frames you will find a 35" extendable handle. This handle allows the user to quickly and easily manoeuvre the fan by simply pulling a spring loaded pin and manually extending the handle.

Unifire fans feature Honda motors for all gas powered PPV fans, specially designed electric motors, and one powerful Tecumseh diesel motor. They provide the fans with enough RPM and power to perform better than other fans on the market and allow us to stay competitive when it comes to price.

Overall the Unifire fans are built to fit the toughest standards of performance and ruggedness. From the 360° of roll protection to the specially designed lower frame, Unifire fans are the most complete, long-lasting, and robust fans on the market. Unifire fans are designed to be usable, and space conscious.

For more information, please contact:

Unifire, Inc., 3924 E. Trent Ave.

Spokane, WA 99202, U.S.A.

Tel: +1509 535 7746

Fax: +1 509 535 9064

Email: info@unifireusa.com

Website: www.unifireusa.com

Ventry Attack Fans

VENTRY SOLUTIONS, INC. is the manufacturer of VENTRY® Fans for Positive Pressure Attack and Ventilation (PPA and PPV). Our mission is to build the best equipment keeping safety, quality, and value in mind with a simple design, for minimal maintenance and intuitive, cost-effective operation.

Positive Pressure Ventilation is a tool every fire department should have in their toolbox. Cancer rates among today's firefighters are increasing along with the higher fuel loads and greater smoke toxicity present in today's modern fire grounds. With proper training, PPV can lower firefighters' exposure by removing the poisonous smoke quickly.

Positive Pressure Attack (also known as Tactical Positive Pressure Ventilation) is an aggressive coordinated fire attack using positive pressure ventilation. This coordinated attack – using a high air volume fan – can transform the fire from a potentially explosive fuel-controlled fire into a stable ventilation-controlled fire within seconds. This rapidly delivers fresh air to victims, reduces temperatures, purges flammable gases, and increases the stability and survivability of the interior environment. With improved visibility, crews can proceed with their attack, safely eliminating the need to crawl blindly through a hot and potentially explosive environment. Interior conditions improve quickly allowing for a fast fire attack, efficient searches, reduced knock-down times and lower environmental tempera-

tures. This minimizes firefighter exposure to environmental toxins and improves victims' survival rates while decreasing property damage.

The first few minutes of a fire attack are crucial. PPA requires knowledge, training, and a fan capable of pushing a large volume of air. The engineered features of VENTRY Fans – including their aircraft style propellers, curved legs and small size – make them ideal for aggressive, coordinated attacks.

The trademarked three-legged design and



smoke-busting safety propellers of VENTRY Fans provide unparalleled versatility and volume. These features allow VENTRY Fans to be placed far back and off to the side where firefighters need them, not in the middle of the path where they are trying to advance hose lines and execute an attack. The propeller materials and shape make them safe and efficient. They quickly move a very large volume of air and produce a narrow air cone for precise aiming from a greater distance. The legs allow the fan to be positioned on uneven ground, straddle debris, set up on stairs, and aim the airstream over obstacles while requiring only one firefighter to operate. Legs provide aiming and unlimited placement of VENTRY Fans, for better access and communication with the crews. With unique, all-terrain versatility, VENTRY Fans stand UP to the challenges of today's fires.

Please visit www.ventry.com to find the perfect VENTRY Fan model and the ideal options for your fire fighters.

For more information, please contact:

Ventry Solutions, Inc.

14128 N Hauser Lake Road

Hauser, Idaho 83854-5619 USA

Office: 208-773-1194 Fax: 208-777-0360

Email: james@ventry.com

Website: www.ventry.com



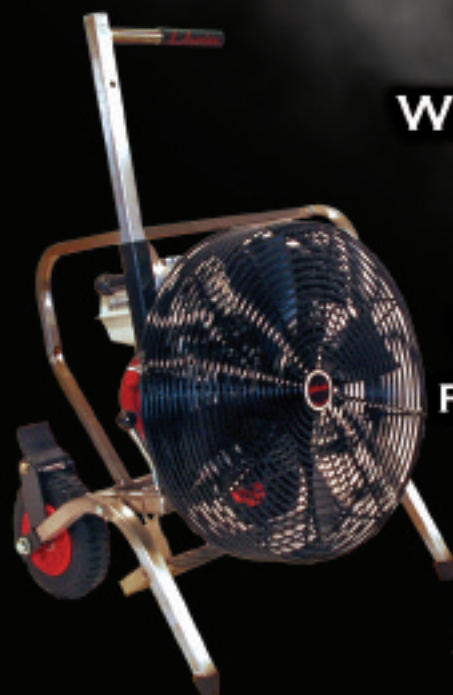
UNIFIRE

MANUFACTURERS OF HIGH PERFORMANCE EQUIPMENT



WHEN TIME MATTERS.
WHEN LIVES ARE AT STAKE.
WHEN SAFETY IS KEY.

CHOOSE THE BRAND
THE TOP TRAINING AND
RESCUE TEAMS CHOOSE.



UNIVENT BRAND SAWS ARE A DIVISION OF UNIFIRE

1-800-745-3282 • WWW.UNIFIREUSA.COM

BOOTMAKERS TO THE WORLD

BLACK DIAMOND IS THIRD GENERATION BOOTMAKERS. WE ARE FOCUSED AND PASSIONATE ABOUT MAKING GREAT BOOTS AND PROUD TO BE WORN BY LEADING FIRE DEPARTMENTS AROUND THE WORLD.

THE INDUSTRY'S ONLY NO LINER PULL-OUT

Stock No. 277-0911

Comfort System

Comfort Fit Plus - with Eversole

Boot Height

14 inches

Leather Upper

Black Diamond's Exclusive FireTuff™ Leather

Lining

CROSSTECH® Fabric with Omaha lining is a high performance, wicking fabric, originally developed for aggressive military applications

Lining Construction

"Stroble" boot lining construction for maximum fit

3-Point Heel Lock System

Exclusive 3-Point Heel Lock for Fit & Comfort

Kevlar Lining

Kevlar® lined for maximum protection



Pull-On System
Integrated & reinforced loop pull-on system

Fusion™ Upper

A powerful alloy of solution dye Nomex®/Kevlar® and Teflon® E.P.P.E. Combines the durability of Nomex, the strength and abrasion resistance of Kevlar and water resistance of a patented Teflon E.P.P.E.

Shin-guard Protector

Comfort form-fitting shin-guard provides maximum protection

Steel Toe

Hi 500, Meets or Exceeds ASTM Standards

Steel Midsole

Stainless Steel

Steel Shank

Double Ridged Steel

Toe Cap Protection

Rubber Toe Cap for high-abrasion



Footbed

3 Density Removable PU Orthotic Footbed, Fabric-covered with TPU heel cradle for overtime comfort

Outsole

Proprietary Rubber Comfort Cup Sole with Comfort Flex, High-Abrasion and Traction Performance



CROSSTECH®
PRODUCTS

FUSION™



Certification

NFPA 1971-2007 Edition Standard for Structural Firefighting

BOOTS THAT FIT YOUR WALLET AND YOUR FEET.

CONTACT BLACK DIAMOND: EMAIL ALUNDER@BDFIRE.COM OR VISIT WWW.BDFIRE.COM

The ASD 535 aspirating smoke detector from Securiton represents the new EN 54-20 generation of devices



Aspirating smoke detectors for early detection

The solution for safety-critical ambient conditions – when standard smoke detectors no longer provide adequate protection

By Stefan Brügger

International Product Manager, Special Fire Detection at Securiton Alarm and Security Systems

There are many monitoring areas where fire detection using point-type fire detectors has its limits. Challenging ambient conditions and interference factors may rule out the use of standard smoke detectors.

Such applications call for the use of special fire detection technology such as aspirating smoke detectors. And thanks to the new European product standard EN 54-20 today's aspirating smoke detectors (or ASDs) achieve new dimensions in detection speed and reliability.

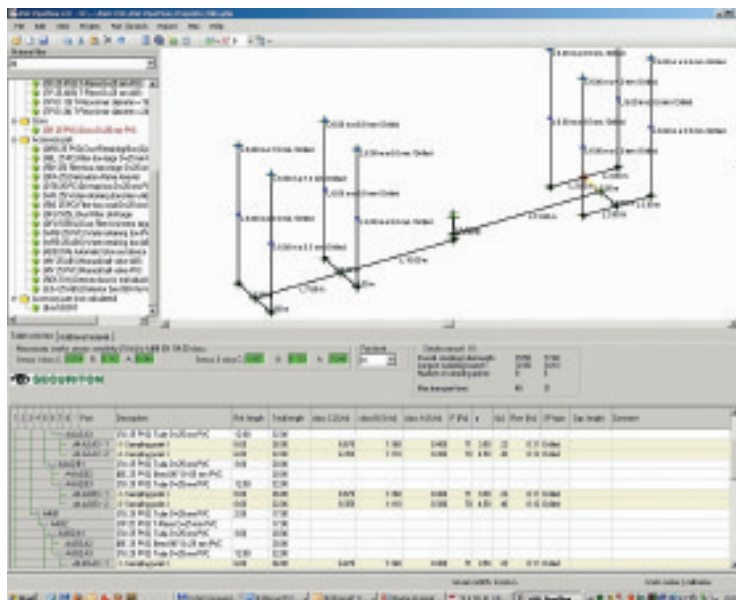
The new European standard EN 54-20 has had a major influence on the use of aspirating smoke detectors. These automatic fire detectors are divided into three categories: Class A detectors for very high sensitivity; Class B detectors for enhanced sensitivity; and Class C detectors for normal sensitivity. And it is worth noting that the

sampling hole of a Class C detector corresponds to the response sensitivity of a conventional point-type smoke detector.

In the past, tests focused on the response behaviour at the evaluation unit of the aspirating smoke detector. Today it is the response behaviour of the system as a whole that is defined, i.e. the aspirating smoke detector complete with sampling pipe, sampling holes or sampling devices and its accessory components. That's why it is no longer necessary to include maximum sampling time requirements in a system's specifications.

ASPIRATING SMOKE DETECTION

The ASD PipeFlow sampling pipe computation software allows asymmetrical sampling pipes



to one point type smoke detector when it comes to the areas to be monitored. The starting point is an aspirating smoke detector that complies with EN-54-20, Class C. Class B aspirating smoke detectors can also be used in the case of halls with very high ceilings. As before, the highly sensitive Class A aspirating smoke detectors are used for early fire detection purposes, for instance in computer centres, clean rooms or other object monitoring applications.

Application

The main area of application of an aspirating smoke detector is not to replace point type smoke detectors. This only makes sense in the case

Approval requirements

The air-flow monitoring requirements have been made considerably more stringent, with even a 20 per cent change in the air-flow rate now detected as an error. But a 20 per cent change in air-flow rate does not mean that 20 per cent of the sampling holes are simply covered up so that a function test can be carried out in the field. The aerodynamic connections are much more complex and only computational programs can supply binding results.

What's also important is that since 1 July 2009 the provisions of the Construction Products Directive 89/106/EEC state that only aspirating smoke detectors that are type-approved according to EN 54-20 and have the relevant Certificate of Conformity can be used. So any national standards for aspirating smoke detectors such as Austrian standard F-3014 or French standard CEA 4022 had to be withdrawn by that date.

The aim of the CE marking procedure is that in Europe a fire detection system and its components now only have to be tested and certified once by a notified body as a construction product based on harmonised European standards (hEN); it can then be used throughout Europe and bear the corresponding CE mark.

The CE marking used previously was affixed to the product on the basis of a manufacturer's declaration. What's new now is that the CE mark can only be affixed after testing and certification by a notified body and once the certificate of conformity and the declaration of conformity have been issued.

Design of aspirating smoke detectors

The planning of aspirating smoke detectors is regulated separately in each country: in Germany it is set out in VDE 0833 Part 2; in Austria, in TRVB S 123; in Switzerland, in the Technical Guideline for Fire Alarm Systems of the SES/VKF and in the UK in BS 5849-1 with the additional FIA Code of Practice for ASD systems. All these guidelines have now undergone revisions (or such reviews are about to be completed). In most countries aspirating smoke detectors are planned in such a way that one sampling hole corresponds

of very large continuous monitored areas that all form part of the same fire zone for example in shopping malls or in large halls. Its principal remit remains the use in applications under difficult operating conditions such as:

- high humidity environments
 - steam baths, tropics
- high temperatures
 - large sauna installations
- low temperatures
 - refrigerated warehouses
 - outdoor applications
- very high ceilings
 - high-rack storage facilities
 - halls with high ceilings
- premises difficult to access
 - laboratories
 - cable tunnels
 - Ex zones
 - high-voltage laboratories
 - hollow floors and false ceilings
- premises at risk of sabotage
 - prison cells
- equipment monitoring
 - electrical/switchgear cabinets
 - telecom facilities
 - IT installations
- dusty environments
 - waste recycling
 - mills
- invisible fire detection
 - collections of cultural artefacts
 - museums
 - churches
 - modern architecture

The new generation

The latest generation of aspirating smoke detectors is ideally suited to these operating conditions. The main features include a universal detector for all applications which can be complemented with a number of options; one or two high-quality smoke sensors in one aspirating smoke detector with adjustable response sensitivities; and an adjustable high-performance ventilator for large monitored areas featuring whisper-quiet operation.

Air-flow monitoring ensures that the sampling pipes are constantly checked for pipe breakage and the sampling holes monitored for pollution. A high-performance ventilator sucks the air from the room or facility being monitored through the sampling pipe to the evaluation unit. There the air is continuously evaluated by the smoke sensors. The display of the ASD system indicates the smoke concentration of the sampled air and alarm, fault and status messages. Any increase in the smoke concentration is detected very early on. Three pre-signals and one main alarm can be programmed for each smoke sensor and are signalled to the CIE (control and indicating equipment) via potential-free relays or directly to an analogue loop. There are four expansion slots in total to which additional relays, interface or memory cards can be installed in modular form.

The specially developed high-dynamic smoke sensor is the result of comprehensive research work. A high power LED combined with an LVSC sampling chamber (Large Volume Smoke Chamber) yields unparalleled adjustable sensitivity with minimum aerodynamic resistance and utmost resistance to pollution and soiling. These measures ensure a long system service life and durability.

Obsolete laser technology

The actual core of the aspirating smoke detector is the smoke sensor and what is crucial here is not just its absolute sensitivity, but its long-term response under difficult ambient conditions. Lasers



were long considered as synonymous with high sensitivity. But today there is no doubt that the technology of a high-power LED offers significant advantages. Firstly, the useful temperature range is much greater; secondly, it has a much longer service life than a laser diode. With the vast



Smoke means an immediate alarm.

SecuriRAS® ASD aspirating smoke detector with HD sensor

Securiton AG, Alarm and Security Systems
www.securiton.com, info@securiton.com
 A company of the Swiss Securitas Group

 **SECURITON**
 For your safety

Aspirating smoke detectors can also be used in very dusty environments



measurement volume of $>1\text{cm}^2$ and very fast measurement times (up to 100 measurements per second) particles are now measured several times, which allows the use of a patented electronic particle suppression system capable of filtering out large individual dust particles. Overall reliability is boosted enormously as a result. The large measurement volume also means that a dynamic scatter angle range is achieved from the forward scatter to the extreme backward scatter, which detects every possible size and colour of smoke particle equally without the need for additional measurement systems (2 wavelengths).

Commissioning and functions

Many installers shy away from familiarising themselves with new aspirating smoke detectors. And yet the new generation of aspirating smoke detectors offers considerable advantages. On simple standard systems for instance the aspirating smoke detector can be activated without a PC and the main settings carried out on the building site itself. A PC tool is also available for expert users; it provides the full range of setting possibilities via a USB interface and allows the data to be visualised.

In difficult ambient conditions in particular it can be very important to record and display all the ambient data during a trial phase lasting several months. And with an optional Memory Card module and commercially available SD storage cards it is also possible to record the values for impaired visibility and airflow for up to a year on the aspirating smoke detector – without an additional PC – and then analyse the data in the office using Microsoft Excel.

An extensive range of accessories is available (e.g. alternative sampling pipes, sampling holes, filters, water retaining boxes, detonation flame arresters). These accessory components are also tested and certified along with the aspirating smoke detector in accordance with EN 54-20. The range of accessories must be listed in full on the certificate issued by the notified body.

With the optional interface the aspirating smoke detector can be ideally integrated into the fire detection system. It is then very easy to display and adjust the day and night sensitivity, for example, from the fire alarm control panel.

Planners of sampling pipes all know that the design of the installation always had to be

symmetrical, which is why T- or H-shaped configurations were used in most cases. However this is not always the optimum solution, particularly on larger premises, and compromises sometimes had to be made due to the space needed by the sampling pipes. But now with the new sampling pipe computation software ASD PipeFlow asymmetrical sampling pipes can be used as well. This results in sampling pipe savings of up to 20 per cent and a further improvement in response time. The only requirement is that the sampling-hole diameter calculated using the software be observed accordingly also at the implementation stage.

Soundproofing included

Most operators of fire alarm systems do not want to hear or see anything of their fire detectors: they just want them to monitor things quietly in the background and then leap into action at the crucial moment. But until now the use of aspirating smoke detectors was limited in applications where noise was an issue as the aspirating noise (the fan in particular) was audible. In most cases it meant that an expensive housing or even special versions of the aspirating smoke detector had to be used. Not so with the latest generation. Thanks to the adjustable high-performance ventilator sufficient air samples are now aspirated even at the whisper-quiet fan level 1 to enable the implementation of large aspirating configurations. ISO 11690-1, i.e. the recommended practice for the design of low-noise workplaces containing machinery, is complied with just as easily as DIN 4109 on sound insulation in buildings, which means that aspirating smoke detectors can be used even in inhabited areas such as hospitals and retirement homes.

Summary

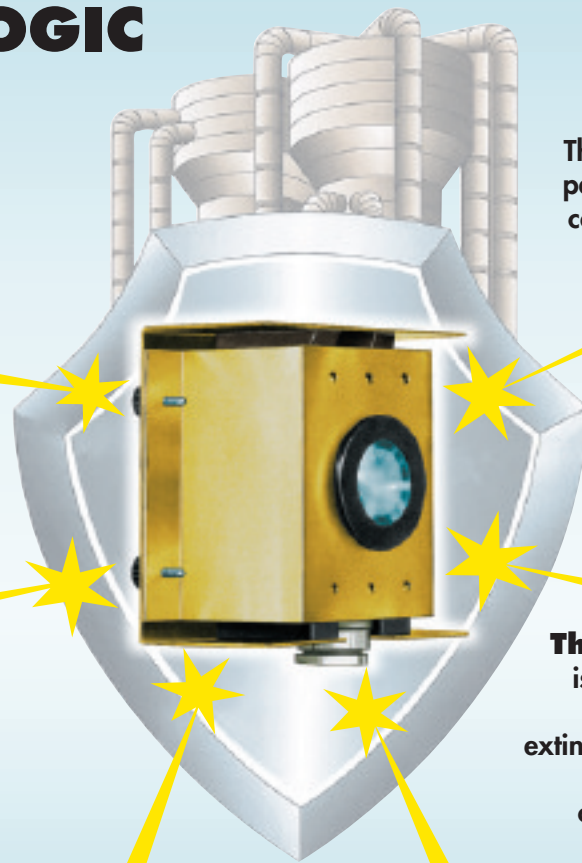
The aspirating smoke detector is a multi-talent that can be used practically anywhere. It includes not only room protection applications (such as high-rack storage facilities, dropped ceilings and raised floors, large halls, museums, galleries, theatres, airports, computer centres) but also object monitoring (such as distribution cabinets and EDP installations). Thanks to the new technology the equipment is even quieter, more resistant and more reliable when it comes to false alarms; what's more it is more responsive than ever before.

APF

Stefan Brügger is the International Product Manager Special Fire Detection at Securiton Alarm and Security Systems in Zollikofen, Switzerland. He is a member of the CEN TC 72 WG 16 and ISO TC 21 SC 3 WG 21 Standard committees for Aspirating Smoke Detectors.
info@securiton.com,
www.securiton.com
T +41319101122, F
+41319101616

CONTROL LOGIC Spark detector

**designed for
dust collection
systems
to protect
storage silos
from the risk
of fire.**



**Sparks fly
at high speed.**

They travel at a hundred kilometres per hour along the ducts of the dust collection system and reach the silo in less than three seconds

The CONTROL LOGIC SPARK DETECTOR

is faster than the sparks themselves. It detects them with its highly sensitive infrared sensor, intercepts and extinguishes them in a flash.

It needs no periodic inspection.

The CONTROL LOGIC system is designed for "total supervision". It verifies that sparks have been extinguished, gives prompt warning of any malfunction and, if needed, cuts off the duct and stops the fan.

ISO 9001

20137 Milano - Via Ennio, 25 - Italy
Tel.: + 39 02 5410 0818 - Fax + 39 02 5410 0764
E-mail: controllogic@controllogic.it - Web: www.controllogic.it



CONTROL LOGIC s.r.l.



**IR FLAME DETECTOR
RIV-601/FA
EXPLOSIONPROOF
ENCLOSURE**

For industrial applications indoors or outdoors where is a risk of explosion and where the explosionproof protection is required. One detector can monitor a vast area and responds immediately to the fire, yet of small size.

BETTER TO KNOW IT BEFORE

Eye is faster than nose.

In the event of live fire the IR FLAME DETECTOR responds immediately

CONTROL LOGIC IR FLAME DETECTOR

**the fastest and most effective fire alarm device
for industrial applications**

Also for

RS485 two-wire serial line



**IR FLAME DETECTOR
RIV-601/F
WATERTIGHT
IP 65 ENCLOSURE**

For industrial applications indoors or outdoors where fire can spread out rapidly due to the presence of highly inflammable materials, and where vast premises need an optical detector with a great sensitivity and large field of view.

ISO 9001

20137 Milano - Via Ennio, 25 - Italy
Tel.: + 39 02 5410 0818 - Fax + 39 02 5410 0764
E-mail: controllogic@controllogic.it - Web: www.controllogic.it



CONTROL LOGIC s.r.l.

What's the best way to stay ahead? Don't fall behind!

(That's why Dynax developed **DX5022!**)

In 1994 Dynax pioneered the industry's first C6-telomer derived Foam Stabilizer for AR-AFFF and AR-FFFP agent producers. Fifteen years later Dynax introduced DX5022, its third generation C6 Foam Stabilizer, which provides superior polar solvent performance.

DX5022 is the Foam Stabilizer of choice by AR-Agent producers worldwide.

DX5022 allows agent producers to formulate 3x3 and 1x1 AR-Agents with little or no polysaccharide gums – Newtonian agents meeting international standards are now possible!

DX5022 is neither derived from nor does it degrade into PFOA. DX5022 meets the US EPA PFOA Stewardship objectives of 2010/2015. And DX5022 has low aquatic and mammalian toxicity.

DX5022: Performance Profile

- Provides superior performance on acetone, ethanol and gasohol
- Reduces or eliminates the need for polysaccharide gums
- Can be formulated into Newtonian 3X3 or 1X1 AR-Agents
- Can be formulated into products that meet EN 1568 and UL 162
- Has low viscosity for ease of handling in production

DX5022: Environmental Profile

- Neither derived from nor degrades into PFOA
- Relatively harmless to Fingerling Rainbow Trout
- Relatively harmless to *Daphnia magna*
- No harmful oral toxicity (rat)
- No skin or significant eye irritation (rabbit)

Additional product information available. Just call us.

DYNAX CORPORATION

PO Box 285, Pound Ridge, NY 10576 USA

T 914 764 0202 techinfo@dynaxcorp.com

F 914 764 0553 www.dynaxcorp.com

dynax
FLUOROchemicals



Vapour Suppression With Class B Foams*

By Ted H. Schaefer[∞], Bogdan Z. Dlugogorski* and Eric M. Kennedy*

Process Safety and Environment Protection Research Group

*The University of Newcastle, Callaghan, NSW 2308, Australia
Tel: +61 2 4921-6176
Fax: +61 2 4921-6920
Email: Bogdan.Dlugogorski@newcastle.edu.au

[∞]Solberg Asia Pacific Pty Ltd, St. Marys NSW 2740, Australia
Tel: +61 2 9673-5300
Email: ted@solbergfoams.com

In an emergency scenario, most non-ignited flammable liquid spills are covered with AFFF foam to prevent ignition. Pressure has been mounting from some environmental agencies not to allow the use of fluorosurfactant based fire fighting foams in this situation, or only allow the use of these foams when there is risk to human life or health. Suppressing a non-ignited flammable liquid spill with an AFFF by the responding agency may result in an action or a fine from a local environmental agency. Are there any fluorochemical free foams that are capable of suppressing vapours of flammable liquid spills?

Vapour suppression with Class B fire fighting foams

As reported by Winder et al.,¹ 47% of all incidents with hazardous materials in Australia involved flammable liquids. Once a fire involving flammable liquids occurs, fire fighting foam is normally applied to extinguish the fire. However, in the situation of a non-ignited flammable liquid spill or a post fire scenario, fire fighting foams are also used for vapour suppression operations to confine the release of a chemical. Significant vapour suppression of hydrocarbons, such as heptane, have been reported to be in excess of 60 min as measured in a closed chamber, or a flux chamber, by using an aqueous film forming foam (AFFF) solution.^{2,3}

AFFF technology uses fluorosurfactants, which gave foam the characteristics of rapid movement on fuels, foam fluidity, self healing, and unrivalled fire mitigation performance. The subsequent formulations of AFFF, which were developed, contained mixtures of fluoro and hydrocarbon surfactants. The fluorosurfactants had characteristics of high temperature resistance, chemical inertness, and created a low surface tension at an air – solution interface. The hydrocarbon surfactants assisted with the generation of the foam structure.⁴

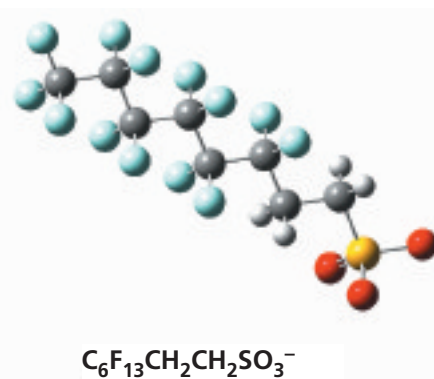
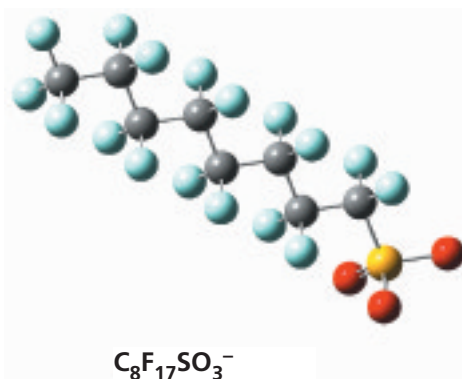
As a consequence, new foams were developed through the 1970s, which included AFFF – alcohol resistant foams (AFFF-AR), film forming fluoroprotein foams (FFFP) and their alcohol resistant version (FFFP-AR). As a result, all Class B foams contained fluorosurfactants. Table 1 summarises the foam technologies and their base chemistry. The fluorosurfactants display a unique structure that involves a combination of perfluorinated and hydrocarbon segments. The result is a surface active agent that has a water soluble end (hydrophilic) and a perfluorinated end that has a non-water soluble (hydrophobic) end. In addition to repelling water, the hydrophobic part of the fluorinated surfactant also repels hydrocarbon liquids and oils; that is, it possesses the lipophobic properties. In effect, the perfluorinated end positions itself in the air phase within a three-phase air-water-oil system.^{5,6}

Manufacturers of fluorosurfactants currently use surfactants based on telomers. The most common fluorosurfactant used in Class B fire fighting foams results from the telomer process with the following formula, $C_6F_{13}CH_2CH_2SO_3^- NH_4^+$.⁷ Efforts are

*This contribution is based on a paper presented at the 7th Asia-Oceania Symposium on Fire Science and Technology, Hong Kong, 2007.

VAPOUR SUPPRESSION

Figure 1. Structures of two fluorosurfactants, a simple PFOS and 6:2 fluorotelomer, positioned for direct comparison of molecular geometry of both anionic species¹¹



now underway to purify the C6 feedstock, thus minimizing C8 and PFOA related compounds under newly published US EPA guidelines. All fire fighting foam manufacturers relied on a small group of chemical companies for sourcing their fluorosurfactants.

It is the perfluorinated portion of the surfactant molecule that equips surfactants with their unique surface chemistry characteristics, including chemical inertness and heat resistance. The heat resistance of the fluorinated moiety was a desirable property for a harsh environment such as fire. The organic portions appear to biodegrade quite rapidly, leaving the perfluorinated segment of the chain as inert and non-biodegradable. Such perfluorinated segments do not occur naturally in the environment.⁶ They do not decay further by photolytic, hydrolytic or biological means, and tend to be highly persistent in the environment, with implications of potential bioaccumulation.⁸ Recent study by the Norwegian Pollution Control Authority (SFT) determined that organisms such as earth worms and sea snails were found to have bio-accumulated C6 fluorochemicals and related by-products in areas that used C6 fluorotelomer based AFFF products.⁹

In the UK, Harman¹⁰ identified environmental concerns relating to the use of fire fighting training grounds, and indeed fire scenes, namely: (i) the hydrocarbon fuel; (ii) the biological oxygen demand (BOD) potential of the foam; and (iii) and any residual materials such as the organohalides, including fluorochemicals.

Klein^{11,12} has put forth an argument that the structural differences between a simple PFOS molecule such as $\text{C}_8\text{F}_{17}\text{SO}_3\text{K}$, and 6:2 fluorotelomer ($\text{C}_6\text{F}_{13}\text{CH}_2\text{CH}_2\text{SO}_3^- \text{NH}_4^+$) are marginal. They have a similar length and the ends of the molecules are identical in diameter. Therefore, in biological systems that function on key-lock mechanisms due to molecular geometry, the aforementioned struc-

tures could have similar acceptance at an active site. Figure 1 illustrates the structure of the simple PFOS and the 6:2 fluorotelomer. To date, no research has been established to prove or disprove this hypothesis.

The recent years have witnessed a new chemistry of fire fighting foams that omit the environmentally persistent fluorosurfactants and fluoropolymers, relying on hydrocarbon surfactants. These foams are sometimes called FfreeF type of fire fighting foams in several regions. Some products may use of polymers to boost performance on biofuels, such as E10 and E15 petrol. By removing the persistent fluorochemicals from the formulation, the long term environmental affect of persistence is mitigated. Though, these products must be considered on the merits of both performance and reduced environmental impact.¹³

Vapour suppression study

Fire fighting foams are employed to secure vapours from spills of volatile organic compounds. The use of a flux chamber to predict the vapour suppressing capability of a fire fighting foam is an evaluative procedure that has been widely applied by the fire safety industry. As found in the literature,³ rules of thumb and predictive charts have evolved, allowing fire fighters to use specific types of foams effectively. For example, Pignato recommends a 15 cm blanket of 6% AFFF to suppress a n-heptane spill for 60 min.³ The question that arises from the above discussion is: Can a fluorochemical free foam be capable of suppressing VOC vapours?

To study vapour suppression in a laboratory environment it is necessary to construct a small chamber to measure the VOC that fluxes through the foam blanket. The flux chambers used in experimentation by Hardy and Purnell,¹⁴ Pignato,³ Hanuaska,¹⁵ and Carruette et al.¹⁶ were made of glass. Balfour et al.¹⁷ and Alm et al.¹⁸ made

Table 1. Summary of foam technology and its chemistry.

Foam Technology	Major Components of Foam Chemistry
AFFF	fluorosurfactants + hydrocarbon surfactants
FPP	fluorosurfactants + protein
AFFF-ARF	fluorosurfactants + hydrocarbon surfactants + polymer
FFFP	fluorosurfactants + protein + hydrocarbon surfactants
FFFP-ARF	fluorosurfactants + protein + hydrocarbon surfactants + polymer
FfreeF	hydrocarbon surfactants + polymer (optional)

further refinement of the experimental flux chamber apparatus by employing a desiccator with a transparent lid and a high density polyethylene base. We included these design modifications in constructing a flux chamber employed in the present study. The assembled apparatus had a diameter of 250 mm, with the total volume of the desiccator calculated as 9.88 L.¹⁹

The flux chamber was plumbed to a nitrogen cylinder with nylon tubing. The nitrogen flow was continuously sweeping heptane vapour to the sampling loop. The sample automatically injected into a gas chromatograph.

Experimental results

The repeatability of the flux chamber experiments was verified with a replicate run of the FfreeF foam, Solberg Re-Healing Foam RF6 experiment having a foam expansion factor of 5.0 and a foam depth of 1.0 cm. A 10% error bar was applied to the data sets to assist in illustration of the good data fit between experiments. The expected primary causes of the observed variation are the sampling frequency and the variations in rate of foam collapse (Figure 2).

The AFFF kept the n-heptane vapour suppressed for approximately 140 min before the point of vapour break-through, while the RF6 foam, under the same conditions, held for approximately 60 min. Formulations A and B could only temporarily suppress the n-heptane vapours. Formulations A and B gave limited vapour suppression through the first 7 min, becoming ineffective beyond that time. It should be noted that Formulation B recommends its product for vapour suppression of water immiscible hydrocarbon fuels.

Conclusions

The fire fighting foams selected for this study included the foams classified as synthetic by the fire fighting industry. PFOS based AFFF was incorporated in the study to provide a base-line of traditional performance. The other synthetic foams selected were not AFFF products and did not contain fluorosurfactants. The three synthetic formulations incorporated in the present investigation included two foam concentrates (Formulations A and B), and RF6.

From the results it is obvious that not all fluoro-surfactant free foams are capable of being employed on a vapour suppression operation. The FfreeF that does appear to be capable of operational vapour suppression is the RF foam technology, of which RF6 included in this study. The AFFF FC-206CF showed the best vapour suppressing capability, however, this PFOS based product has been discontinued and is no longer available.

The common practice of vapour suppression from cold spills and from post-fire evaporation of fuel using fire fighting foam includes the reapplication of foam at 15 to 25 min intervals to maintain the foam blanket. The foam application density is normally in the range of 4.1 to 6.5 L m⁻² min⁻¹,²⁰ which is at least 10 times higher than that utilised in this study. Normally 7 cm of foam would be recommended to suppress n-heptane for approximately 20 min.³

In February 2010 a major refinery in Melbourne, Australia had an unleaded petrol spill of over 20,000 L during a storage tank failure. The local fire brigade successfully suppressed the unignited



SOLBERG

Solberg offers products of high quality and within the highest technology standards to the international fireprotection market

FIGHTING THE FIRE DRAGON



WITH CLASSIC AFFF/ATC, MODERN ORGANOHALIDES FREE FOAMS OR CLASS A FOAMS



RE-HEALING FOAM™

Organohalides free foams



ARCTIC FOAM™
AFFF/ATC foams



FIRE-BRAKE FOAM™
Class A foams

Head Office Norway	Australia / Asia
Solberg Scandinavian AS Olsvollstranda N-5938 Sæbøvågen Norway	Solberg Asia Pacific Pty Ltd 3 Charles St, St Marys, 2760, NSW Telephone (612) 9673 5300 Fax (612) 9673 5303

Emergency Stock Hotline

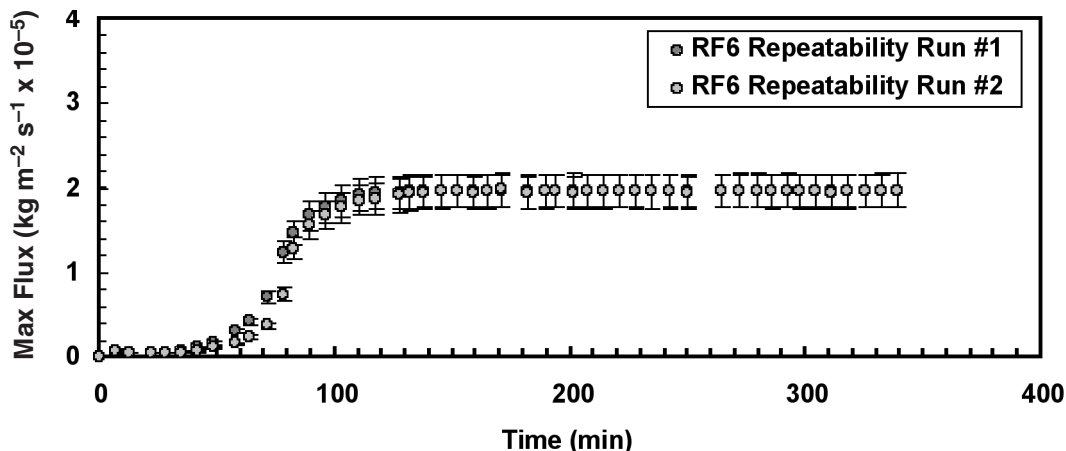
(Norway)
+47 976 40 000

(Asia Pacific Region)
+612 9963 3148




www.solbergfoams.com

Figure 2. Repeated mass flux experiments of RF6 with 10% error bars attached to all data points



spill with Solberg Re-healing Foam Technology (RF Foam) until salvage operations were completed.

In conclusion, not all non-fluorochemical FfreeF foams are effective in vapour suppression. We have identified that at least Solberg RF Foam Technology is capable of successful vapour suppression operations. FC-206CF AFFF showed its ability for longer duration vapour suppression, however, it is necessary to consider local legislation and the ability to successfully collect and destroy the AFFF due to the environmentally persistent fluorochemicals. While FfreeF foams can be successfully treated in activated sludge waste treatment plants. **APF**

References

- Winder C., Tottszer A., Navratil J., Tandon R. (1992). "Hazardous materials incidents reporting: Results of a nationwide trial". *J. Hazardous Mater.*, 31, 119-134.
- Alm R.R., Olsen K.A., Reiner E.A. (1987a). "Stabilized foam: A new technology for vapor suppression of hazardous materials". *Proceedings of the International Congress on Hazardous Materials Management*, Chattanooga, TN, USA, June 8-12.
- Pignato J.A., Jr. (July 1984). "Evaluation test for foam agent effectiveness". *Fire Eng.*, 46-48.
- Peterson H.B., Jablonski, E.J., Neill, R.R., Gipe, R.L., Tuve, R.L. (August 1967). "Full-scale fire modeling test studies of "Light Water" and protein type foams". NRL Report 6573, Naval Research Laboratory, Washington DC.
- Dlugogorski B.Z., Kennedy E.M., Schaefer T.H. and Vitali J.A. (2002). "What properties matter in fire-fighting foams?". *Proc 2nd NRIFD Symp*, Tokyo, Japan, 57-78.
- Kissa, E. (2001). *Fluorinated Surfactants and Repellents*. Marcel Dekker Inc., New York.
- Schultz M.M., Barofsky D.F., Field J.A. (2004). Quantitative determination of fluorotelomer sulfonates in groundwater by LC MS/MS. *Environ. Sci. & Technol.* 38, 1828-1835.
- Renner R. (2001), "Growing concern over perfluorinated chemicals", *Env Sci Technol* 35, 154A-160A.
- Tremoen S. (2008), "Screening for polyfluorinated compounds at four fire training facilities in Norway", Statens forurensningstilsyn. (TA – 2444/2008)
- Harman R. (2002). "The environmental foam challenge". *Proc. IAFFA Conf.*, September 2002, London, UK.
- Klein R. (2005). "Foams, powders and gels – The evolution continues". *Ind. Fire J.*, July, 5-15.
- Klein R.A. (2005b). "Firefighting foams – reducing the risk". *F & R*, 3rd Qtr, 22-27.
- Schaefer TH, Dlugogorski BZ and Kennedy EM, (2003) "New non-fluorosurfactant-based formulations for replacement of class B foams", *Proc Int Aviation Fire Prot Assoc*, Singapore, CD-ROM, 1-28.
- Hardy H.L., Purnell C.J. (1978). "Use of foam for the emergency suppression of vapour emissions from organic isocyanate liquid surfaces". *Am. occup. Hyg.*, 21, 95-98.
- Hanauska C.P., The Suppression of Vapors From Flammable Liquids With Stabilized Foams, Masters Thesis, Worcester Polytechnic Institute, 1988.
- Carruette M.L., Persson H., Pabon M., "New Additive for Low Viscosity of AFFF/AR Concentrates – Study of the Potential Fire Performance", *Fire Tech.*, 40, 367-384, 2004.
- Balfour W.D., Schmidt C.E., and Eklund B.M. "Sampling Approaches for the Measurement of Volatile Compounds at Hazardous Waste Sites", *J. Hazardous Mater.*, 14, 135-148, 1987.
- Alm R.R., Olsen K.A., Reiner E.A. , "Stabilized Foam: A New Technology for Vapor Suppression of Hazardous Materials", *Proceedings of the International Congress on Hazardous Materials Management*, Chattanooga, TN, USA, June 8-12, 1987.
- Schaefer T.H., Dlugogorski B.Z. and Kennedy E. M., "Vapour suppression of n-heptane with fire fighting foams using laboratory flux chamber", *7th Asia-Oceania Symp. Fire Scie. Tech.* (in review).
- NFPA 11, Standard for Low-Expansion Foam, National Fire Protection Association, 2002.

Table 2. List of fire-fighting foams used in experimentation including some physical characteristics of the concentrates.

Property	FC-206CF [3M 1999]	Solberg RF6 [SSAS 2005]	Formulation A	Formulation B
Use concentration	6%	6%	0.4%	1-3%
Technology base	AFFF	Synthetic	Synthetic	Synthetic/ bacteria
Surfactants system	Hydrocarbon/ fluorocarbon	Hydrocarbon	Hydrocarbon	Hydrocarbo and selected non-toxic/ non- pathogenic microbes

You have 30 seconds to locate the missing person before it's too late.

Impossible?



Not if you have the Argus thermal imaging camera.

Thousands of fire and police units around the world rely on the technologically superior Argus thermal imaging camera to save lives and protect their own. Its high resolution detector, crystal clear display screen, and x4 zoom ensure maximum visibility in any situation. It's also extremely light at just 3lbs but not at the

expense of its strength. The Argus is one of the toughest cameras out there, withstanding extreme temperatures thanks to its rugged and durable casing. And with SceneSave image capture for up to 100 images, plus spot and ambient temperature detection the Argus won't leave you doubting its ability.

www.argusdirect.com

Camera shows are the Argus4 and the Argus4 HR320. Part of the Argus thermal imaging camera range.

argus®
thermal imaging from ezv

**Outstanding
cutting force**

501 kN

performance Line

**Combination Tool
Type LH-CO-1360**



available
with Mono Coupling

- Lightweight, powerful combi tool
- Spreading width up to 360 mm
- Cutting force up to 501 kN
- Spreading force up to 360 kN
- Integrated attachment points for the direct connection of pulling chains

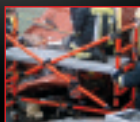
INTERSCHUTZ
DER ROTE HAHN
INTERNATIONALE LEISTESSI FÜR RETTUNG,
BRAND- / KATASTROPHENSCHUTZ UND SICHERHEIT
KRIEGS 7. - 12. JUNI 2010
Hall 2 / Stand F62



Rescue Tools



Power Units



Rescue Platform



Stabilisation



Lifting Bags



Floodlight



LANCIER
Hydraulik

GmbH & Co. KG

www.lancier-hydraulik.de

For more
than 35 Years



Rescue Tools
„Made in Germany“

LANCIER Hydraulik GmbH & Co. KG • von-Siemens-Str. 1 • 48346 Ostbevern, Germany • Phone +49 (25 32) 95 70 80 • www.lancier-hydraulik.de

**INNOVATIVE FIRE SUPPRESSION,
LEADING EDGE TECHNOLOGY,**

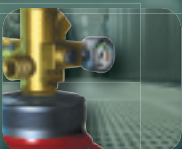
**AND
RETURNED
PHONE CALLS.**

**WITH FIKE, IT'S NOT JUST ABOUT PROTECTION.
IT'S ABOUT PEOPLE.**

- *Innovative, reliable clean agent fire suppression*
- *Fast, responsive service*
- *Market, codes and legislation expertise*
- *Solutions that protect your bottom line*

**THERE ARE MANY REASONS TO CHOOSE FIKE
FOR YOUR FIRE SUPPRESSION APPLICATIONS.**

Technology



Systems



Support



Budget



Fike®

WWW.FIKE.COM

+60-3-7859-1462



Selection Considerations for Clean Agent Fire Suppression Systems

By Kevin Kenny

Fike Global Product Manager

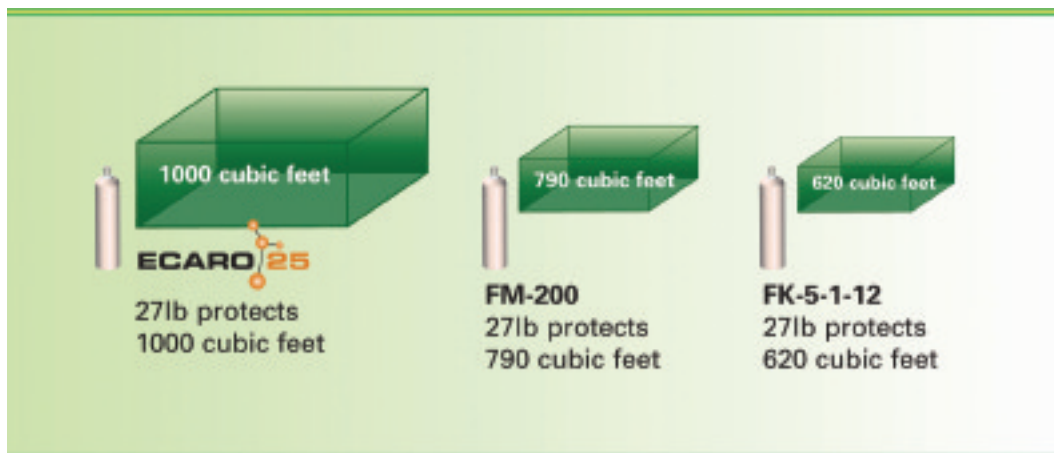
Basic fire protection systems, such as fire sprinklers, provide personal and structural protection. But when it comes to high-value assets, water can be just as damaging as fire and smoke.

Clean agent fire suppression systems are superior to simple water systems because they extinguish a fire faster (and more efficiently) than water, require no clean-up and prevent smoke and soot damage. Clean agents extinguish fire as a gas that permeates into cabinets, wire-laden ceilings and subfloors and other obstructed areas (where water cannot reach). Clean agents are uniquely suited to protect electronics hidden within equipment and enclosures, where fires are likely to start. By flooding an area with a gaseous fire fighting agent, even obscured or hard-to-reach fires are quickly extinguished, usually long before they are seen.

History

For more than 30 years, Halon 1301 and Halon 1211 were the preferred fire extinguishing systems for many high value asset and electronic applications, as well as for irreplaceable artifacts that might be damaged by water-based systems. However, in 1994, the Montreal Protocol severely limited, and eventually halted the production of halons due to their implication in the destruction of stratospheric ozone.

Prior to this phase-out, an industry-wide effort was undertaken to discover alternative fire extinguishing agents. The ideal solution was to find the agents that performed like Halon, but with zero



ODP (Ozone Depleting Potential) and low GWP (Global Warming Potential). As a result of this effort, a number of Halon alternatives have been introduced to the market since the early 1990's. Today, the primary choices for clean agent fire suppression are:

- Hydrofluorocarbons or HFCs. (Dupont™ FM-200™ and FE-25™ are two of the most commonly known HFC agents)
- Perfluorinated ketones or PFCs (such as 3M's Novec™ 1230)
- Inert gases (usually a blend of argon and nitrogen)

There are over 300,000 fire suppressions systems in the world using FM-200 agent, making it the clear leader. FM-200 has a long track record of success and is well known by fire professionals globally. FE-25 systems (known by the brand name ECARO-25®) have grown in popularity since its commercial introduction in 2004, mainly due to the fact that it is the most economical Halon replacement option. Novec 1230 systems, another relative newcomer to fire suppression, have found success in projects desiring low GWP. Inert gas systems are popular in Europe and other regions that demand the absolute minimal environmental impact.

All these agents have shown to suppress fires, and are much more effective than basic water systems in high-value protected spaces. However, there are other factors that should be considered when evaluating which system is the best for a particular application.

1. Performance

HFCs and PFCs extinguish fires by lowering the temperature below what is required for the combustion process to occur and/or chemically interfering with that process. Inert gases extinguish fires by reducing the oxygen concentration level in the protected space to a point that a fire cannot be sustained, yet is still safe for human occupation. While both methods are effective, the heat reduction/removal method is much faster and requires less extinguishing agent percent per volume.

Though many inert gas systems are more efficient in hold time (the amount of time a clean agent must remain in a protected space to extinguish the fire), than HFCs, HFCs are typically more efficient than PFCs. More specifically, FE-25 is 15% more efficient in hold time than FM-200 and 25% more efficient in hold time than Novec 1230.

2. Cost

In today's economic climate, cost-effectiveness is a vital consideration. Fortunately, clean agent systems can be designed to meet the budget requirements, and still provide a significantly more effective method of protection versus sprinklers. Halogenated systems are typically the least expensive in terms of initial cost. PFC systems are more expensive, and inert gas systems are usually the most expensive in initial costs. For example, systems using FE-25 can be up to 38% less than comparable Novec 1230 systems. As stated above, FE-25 is an excellent choice for applications that need the protection of a clean agent, but want the most economical solution. FE-25 systems are also well suited for Halon replacement projects because many times an existing Halon piping network can be used, providing substantial savings versus other systems.

Inert gas systems are usually the highest initial cost due to the number of containers required versus HFCs and PFCs. However, many building owners are looking more carefully at the "life-time" costs of a suppression system, including expenses for maintenance, refills, and testing over many years. Because inert gas systems are extremely inexpensive and easy to re-fill, they are potentially the most cost-effective solution over the usable lifetime. Additionally, inert gas systems using selector valve technology can be very cost effective in large and/or multiple area applications, since one centralized inert gas system can be used to protect several different risk areas.

3. Environmental factors

Environmental considerations are increasingly important to building owners around the world. All clean agent fire suppression systems on the market are considered "green" due to having zero ODP. But some projects may require a system with the least amount of environmental impact. When this is the case, inert gas systems (using argon and nitrogen) are typically the preferred choice because they are the only systems with zero GWP. Some inert systems include a small amount of carbon dioxide in the agent blend, so that should be considered when evaluating inert systems from different manufacturers. A PFC system such as Novec 1230 can also be a consideration for environmentally-driven projects due to its very low GWP. Hydrofluorocarbons have a higher GWP than inert gases or PFCs, although still well below the GWP of Halon.

Manufacturer and Designer
of Globally Approved
Fire Extinguishing Systems



Clean Agent
High Pressure Carbon Dioxide
Low Pressure Carbon Dioxide
Water Mist
Foam
Alarm and Detection
Air Sampling Smoke Detection

YOUR GATEWAY TO A NEW KIND OF SERVICE.

+1 219-663-1600 • www.janusfiresystems.com

1102 Rupcich Drive, Crown Point, IN 46307

The International **FIRE & EMERGENCY TRAINING LEADER**



TRAIN ■ SERVE ■ RESPOND

TEEX trains emergency response personnel from more than 45 countries each year. Each course can be tailored to meet your exact needs in a variety of areas.

- Municipal / Industrial Firefighting
- Industrial Emergency Response Specialist
- Hazardous Materials Response
- Search & Rescue / USAR
- Aircraft Rescue & Firefighting
- Fire & EMS Leadership
- Fire Officer / Instructor
- Marine - Shipboard Firefighting
- Oil Spill Response
- Emergency Medical Service
- Emergency Management / NIMS
- Incident Command
- LNG Emergency Response
- Assessment / Technical Assistance

Schedule these or any of our 130+ courses today.
www.teex.org/fire • 1.866.878.8900



TEXAS ENGINEERING EXTENSION SERVICE
A Member of The Texas A&M University System
301 Texas • College Station, TX 77843-7696



Fike FM-200 system protects engineering firm's computer room facility



Recently, there has been much discussion globally about the use of HFCs in all types of applications, most notably in refrigeration. Some countries are beginning to evaluate HFC usage in light of its environmental impact. In most areas around the world, HFCs are commonly used in fire suppression, and there is no indication that this will change in the foreseeable future, even if HFC usage is reduced in other applications such as refrigeration. Despite all the speculation and (often incorrect) predictions for the future of HFC products, building owners should seek the facts about HFCs for fire protection, and make educated decisions based on those facts.

4. Footprint

Footprint, or the amount of room actually devoted to the fire suppression system, can be an important factor in applications where space is limited. Due to the necessity for high pressurization, inert gas systems usually require a large number of tanks for a typical space. This may limit the use of inert gas systems in applications with limited space, such as offshore oil platforms, Halon replacement projects, protected spaces within a multi-tenant building, or smaller urban buildings. When there is limited space for clean agent containers, FM-200, FE-25, or Novec 1230 are often the appropriate choice.

It should again be noted that inert gas systems have the important distinction of being able to locate the storage containers far away (up to 61m) from the protected areas. So even if there is limited space for containers within the protected area, these systems can still be viable if there is available space in another part of the facility, such as a storage room or garage.

5. Halon replacement

Internationally, the production of Halon has ceased, but the replacement protocol of old Halon systems varies greatly. In addition to the almost worldwide production ban on Halon 1301,

numerous countries have taken steps to mandate the removal of these systems, including many parts of Europe and Australia. Canada has implemented a Halon 1301 phase out plan, including a halt on the refill of fixed Halon systems beginning in 2010. In addition, the only sources for this gas are recycled Halon and inventories produced prior to 1994. This limited supply continues to spur the need for replacement options, even in areas that have not banned the existence of such systems.

Of all the options, FE-25 demonstrates the closest performance match to Halon 1301. Due to the physical similarities between gases, FE-25 systems can often use an existing Halon piping network. FM-200 and Novec 1230 systems offer a similar general footprint to Halon systems, but usually require new piping.

6. Chemical vs. natural

All the clean agent options discussed in this article are considered safe for occupied spaces. For some building owners, the decision of which product to use comes down to a chemical ("man-made") solution versus a more naturally occurring solution. Chemical clean agents have definite benefits, including speed, footprint, and cost. Inert gases have the benefit of being an absolutely green solution, without any concern of releasing chemicals into the atmosphere. Some users may be concerned about the concept of oxygen reduction employed by inert gas systems in occupied spaces. An inert system reduces the oxygen level to approximately 12% by volume – a level that will not support a combustion reaction (thus extinguishing the fire), but is perfectly safe for human exposure over a short period of time.

Because all the current agents are safe, the issue of chemical versus natural is not about performance, but preference. Fortunately, many manufacturers of clean agent suppression systems offer both types of systems, so the end user has plenty of options to meet their protection and budget needs.

Summary

The world is increasing its reliance on sophisticated electronics, telecommunications, data centers, advanced medical technologies, and many other types of specialized equipment. Protecting these unique assets from fire requires more than a simple sprinkler system. It's important to understand the differences between the various clean agent systems, in order to make well-informed decisions about which one to employ. Manufacturers will naturally try to portray their offerings in the best light possible, and may sometimes fail to provide a balanced view of all options. Simply stated, every clean agent system on the market has benefits, and every system has aspects that could be considered drawbacks. But all clean agent systems provide an advanced level of fire protection and should always be considered for high value asset areas.

APF

Making firefighting safer!



PAB Personal Protective Equipment

firefight series

Made of
composite fiberglass

FIRE HT 04 Composite

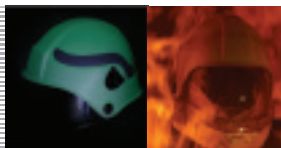
We are introducing the firefighter helmet of tomorrow. It is designed to protect the head in the most extreme conditions. Development and implementation of new composite technology in combination with established design enable full protection even at shorter (flash over flames) temperature exposures, reaching up to 1000 °C. These advantages are rounded up with extreme lightweight (1.200 g) and such design that supports a wide selection of compatible accessories. Structural firefighting has never been safer.



PAB Personal Protective Equipment
Most 26, 52420 Buzet – Croatia

tel: +385 52 662 662
fax: +385 52 662 254

info@pab-buzet.com
www.pab-buzet.com



Ship Halon Phase Out

GIELLE™
www.giellemarine.com

Retrofit with Gielle Clean agent fire suppression systems

- Utilize existing piping
- 1 to 1 cylinder/nozzle replacement
- Existing Halon Systems / Existing HCFCs Systems
- Express service
- Worldwide 24h service
- Full range of International Approvals

Imo Halon Banking authorized
FP.1/Circ.37 - Jan 2009



Gielle / info@giellemarine.com





Fighting Fires in Hostile Marine Environments

By Paul Gibson

International Sales
Manager, Bristol
Uniforms Ltd.

Fighting fires at sea presents a set of special challenges which impact on types and availability of equipment, firefighter training and personal protection in what can be some of the most hostile environments encountered by firefighters anywhere in the world.

Marine firefighting falls broadly into two main categories. Fires aboard ships could be considered the larger of the two groups with the other being all types of floating or fixed structures associated with undersea oil and gas exploration and production. There are currently around 575 mobile offshore drilling rigs available around the world of which some 480 (83%) are currently in active service. By contrast, the most recent figures available indicate a global maritime fleet of some 31,000 vessels with a gross register tonnage exceeding 1,000 tonnes.

Fires at sea are relatively rare and, when they do occur, only occasionally result in fatalities. This is true for both shipping accidents and those involving oil and gas drilling rigs and production platforms. Safety at sea has been a focus of attention over the last 25 years during which time organisations such as SOLAS have helped to improve safety standards through vessel design, construction and maintenance as well as levels of preparedness for accidents when these do happen.

Statistics show that amongst the 16 recorded oil and gas rig fires in the last 20 years around the world there have been 53 deaths all of which resulted from just 5 of these fires. The largest single loss of life incident was on the Mumbai High North rig in the Indian Ocean in 2005 when 22

lives were lost. No fatalities were recorded for the other 11 fires.

High concentrations of passengers on cruise liners increase the potential for heavy loss of life and yet modern vessel construction and safety standards have resulted in few deaths from the 12 cruise ship fires which have occurred over the same 20 year period. Statistics show that, apart from two major tragedies in which a total of over 1100 died, only 9 other deaths were recorded in the remaining 10 cruise ship fires around the world.

A study¹ in 1999 into the causes of total loss accidents involving vessels at sea, taken over a 25 year period, showed that fire together with explosion accounts for 25% of the toll. These results were drawn from an initial sample of 500 merchant ships, of varying types and tonnage, registered under 15 different flags. A second and larger analysis, comparing the same 15 flags on a sample of 1,500 merchant ships, produced similar results. Fire ranks second as the primary cause of total losses, with fire in the engine room as the most common cause involving 61 ships (55% of the total caused by fire). Total accidents by fire involved 111 ships in the survey and represents 22.2% of the total.

1. Fire Ranks Second in Maritime Casualties by S. Mendiola & J.J. Achútegui, and M.A. De la Rosa

Special hazards

By the very nature of their association with highly flammable materials, many fires fought at sea involve fuel oils, gases, plastics and feedstock, synthetics derived from oil and naturally combustible materials such as timber, a wide range of products made from wood, man-made timber composites and plastics. Spontaneous combustion is another hazard and can be associated with bulk cargoes of coal, fertilizers, fish meal, a number of ores, and feeding stuffs which, when stored in less confined spaces, are generally considered non-hazardous.

In many cases these are hot fires exhibiting characteristics such as extreme flame lick and elevated temperature firefighting environments. These present special hazards for the marine firefighter which, although sometimes experienced by structural firefighters on land, are the most common types of fire experienced either on offshore platforms or aboard cargo shipping. In such situations flammable liquids are almost always present and give rise to the greatest potential hazard even where the initial source of the fire may be of a less hazardous nature.

Fighting fires at sea, and from the sea, also means having to contend with weather conditions and constant movement from waves or swell, as well as strong winds, which can make for more unpredictable environments adding to the already difficult conditions created by the fires themselves.

Other attendant risks relate to the rescue element of any marine fires where the difficulties experienced by rescuers in bringing injured or stranded workers or crew from rigs, platforms or

disabled shipping are made considerably more hazardous than many structural fires on land. In addition, there are frequently far fewer emergency medical resources available to treat the injured who, in many situations, can be suffering from serious burns or toxic fume inhalation requiring urgent attention. This can often only be provided by helicopter airlifting to the nearest hospital or, occasionally, to an on-board hospital facility available on military vessels or large cruise liners if they are within airlift distance from the emergency location.

Special protection

Marine firefighting has for many years been seen as a specialist area requiring firefighter PPE uniquely developed to protect the wearer from the particular hazards associated with close proximity engagement with hot fires, highly flammable substances, severe flame lick, high wind velocity and heavy rain – all of which are potential features of commonly experienced firefighting conditions at sea.

To protect firefighters in such conditions, protective clothing has been progressively developed over the years to maximise safety in such hostile and unpredictable environments. Typically there are two main types of firefighter PPE in use around the world. One is the Fleet Suit which is an internationally recognised close proximity coat and trouser which is manufactured using a lightweight flame retardant material, typically a Protex cotton outer fabric, lined with quilted fronts and sleeve tops. A higher level of protection is provided by incorporating a full thermal barrier. This is typically achieved using a Nomex outer with a flame retardant cotton

FIRE RAY® Optical Beam Smoke Detectors

Low cost, field-proven fire protection
for large open areas

When it comes to optical beam smoke detectors no other company has the experience, or the product range, of Fire Fighting Enterprises. **FIRE RAY®** offers both reflective and end-to-end models and ATEX approved units for hazardous areas, encompassing all applications.

With over 650,000 beams installed worldwide, including in some of the world's most prestigious buildings, it is clear that the **FIRE RAY®** series is the choice for both installers and specifiers.



T +44 (0) 1462 444 740 F +44 (0) 1462 444 789 E sales@ffeuk.com W www.ffeuk.com



FIRE RAY® - The leading
light in smoke detectors

quilt. Bristol manufactures both types of Fleet Suit which are coat and trouser combinations in yellow in a variety of sizes.

To protect against the hazards of severe flame lick and intense heat experienced in hot fires associated with gases, oils and petrochemicals, the solution is provided in the form of aluminised suits and coveralls. These are available in various styles with Bristol's offer including both one-piece and two-piece garments using an A1 aluminised aramid fabric outershell. To provide added flexibility in protective features, with the two piece suit the coat component can also be supplied with an integral Modacrylic thermal lining. The trouser can also be provided fully lined with Modacrylic. The one-piece coverall features a Modacrylic lining throughout with added thermal padding at strategic points. A range of compatible helmets, gloves and boots ensure that protection is fully integrated for maximum wearer safety.

Performance standards

Given the global nature of maritime firefighting, the main performance standards required are internationally recognised but supplemented by a large number of national accreditations issued by maritime or shipping agencies around the world.

Fleet Suits are designed and manufactured to standards which reflect the principal exposure hazards faced by marine firefighters and which are encapsulated in EN ISO 11612 *Protective Clothing for Industrial Workers*. Aluminised suits fall into a special category and are frequently accredited separately by national agencies responsible for marine structures or shipping operating in their territorial waters or where they have jurisdiction over maritime safety.

Classification Societies have been established in a number of the major maritime nations of the world. A classification society is a non-governmental organization in the shipping industry. It establishes and maintains standards for the construction and classification of ships and offshore structures, monitors construction to ensure it conforms to these standards and carries out regular surveys of ships in service to ensure compliance with these standards.

In addition to key UK classification and regulatory organisations, including Mariner's Wheel, Lloyds Register of Shipping and the UK Department of Trade & Industry, classification societies with regional influence around the Pacific Rim include the Department of Transport, Australia, the China Classification Society and the Russian Maritime Register of Shipping.

The search for further improvements in safety at sea will undoubtedly continue. Whether it is the safety of those who travel by sea or work in marine environments, or those whose role it is to save lives at sea and minimise deaths and injuries, especially where fire or explosions place lives at immediate risk, all benefit from experience gained from previous disasters which is regularly being evaluated. This, in turn, informs both the techniques used to fight fires and the design and materials used in the development of firefighter PPE. By drawing on the technological advances of fibre and fabric manufacturers, leading PPE designers and manufacturers, such as Bristol Uniforms, are able to bring to the market personal protective equipment which offers the safest working environments for those emergency services whose expertise and skills are relied upon when accidents of this nature do happen at sea.

APF



PROTECTING THE WORLD'S FIREFIGHTERS



Bristol - A global force in firefighter protection

Relied upon by firefighters in over 110 countries, Bristol can confidently claim to be a global leader in the specification, design and manufacture of firefighters' personal protective equipment (PPE). We deliver our world class products and support services through a network of 70 specialist distributors worldwide, while commanding a dominant share of the UK market.

Bristol Uniforms Ltd

Bristol, United Kingdom, BS16 5LL

Tel: +44 (0) 117 956 3101

enquiries@bristoluniforms.com

www.bristoluniforms.com



PANTHER ARFF VEHICLES

READY TO SERVE



ROSENBAUER WORLD CLASS TECHNOLOGY

ROSENBAUER serves the Airport Fire Services around the world with innovative and professionally designed quality PANTHER ARFF Vehicles.

Chassis, superstructure, high reach extendible turret with piercing tool and superstructure are fully integrated, designed and manufactured within the ROSENBAUER Group.



INTERSCHUTZ

DER ROTE HAHN

LEIPZIG 7 - 12 JUNE 2010

Visit us at hall 4.



ROSENBAUER INTERNATIONAL Aktiengesellschaft
4060 Leonding, Paschinger Str. 90, AUSTRIA

Tel.: +43 (0)732 6794-0

Fax: +43 (0)732 6794-83

E-Mail: office@rosenbauer.com

<http://www.rosenbauer.com>



The technology of fire fighting

By Konrad Marshall

Communications Officer,
Bushfire CRC

In an Australian first, the Bushfire CRC is evaluating a DC-10 air tanker brought to Victoria from the United States to help bushfire operations – a research trial that promises to add to the limited knowledge in this area.

The business of firefighting is done on the ground. It's firefighters that put out fires. Victoria's Department of Sustainability and Environment (DSE) Chief Fire Officer, Ewan Waller is adamant about this.

However, he concedes that advances in technology – especially in aerial suppression of bushfires – have made the task of better fire management more achievable.

"Over the years, firefighting agencies have benefited from advanced technology which has seen bushfire attack matched by innovation," Waller said. "That includes better and more effective aerial attack."

A major advancement in 1983 was the use of infra-red technology with the introduction of airborne infrared line-scanning, significantly improving the fire agencies ability to map large areas of fire. The subsequent introduction of Forward Looking Infrared (FLIR) equipment enhanced efficiency of mopping up operations. Both were used towards the end of the 1982/83 fire season after the Ash Wednesday fires.

In 1997, the Erickson S64F Airplane helicopter (nicknamed "Elvis" in Australia), with a 9000 litre capacity bellytank and 45 second hover fill time was contracted by the state of Victoria, the first time such a helicopter had been used in Australia. And this summer, Victoria contracted 40 aircraft for firefighting operations.

In one of the most fire-prone environments in the world, investigating all options led to a new venture this fire season. Owing to the increasing trend in rainfall deficits, climate change and the

consequent increase in fire risk, the Victorian Government decided to trial a Very Large Aerial Tanker (VLAT) to assist this fire season.

The DC10 – nicknamed "Vicki" – is capable of dropping a payload of up to 45,000 litres of water and 42,000 litres of retardant or foam, dwarfing other aerial bombers such as the "Elvis" helicopter.

"Among a number of options, the DC10 was selected based on its extended use in the United States," Mr Waller said. "The Victorian trial, which ran between January and March, is being evaluated by the Bushfire Cooperative Research Centre (CRC) and included an evaluation of the aircraft's performance in Victorian conditions."

The trial was funded by the Victorian Government through the state's Country Fire Authority and Department of Sustainability and Environment, with a Commonwealth Government contribution provided by through the National Aerial Firefighting Centre. The evaluation itself, involving Bushfire CRC researchers from the CSIRO and firefighting agencies, aimed to assess the aircraft in a range of situations (remote fires, interface fires, forest fuels, grass fuels, flat terrain, hilly terrain) with different payloads, to assess its capabilities and limitations under Australian conditions.

"The Bushfire CRC has extensive experience evaluating aerial suppression efforts, including a range of projects with the National Aerial Firefighting Centre," said Bushfire CRC CEO Gary Morgan. "But large aircraft of this sort have never been used for firefighting in Australia."

Waller said he is particularly interested in the pattern of the drop of material from this aircraft

The DC10

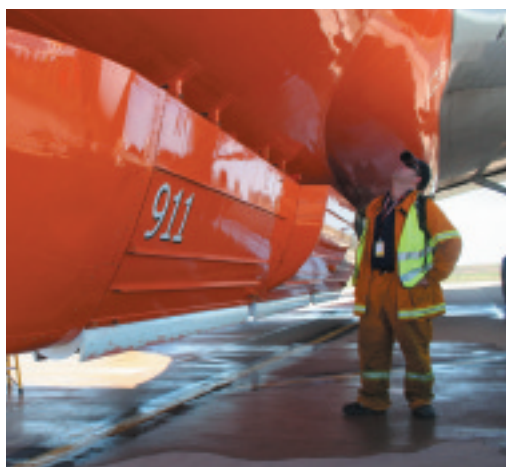
The DC10 can hold approximately 42,000 litres of retardant or 45,000 litres of water, more than four times as much as some of the helicopters currently used for fire suppression. It complements the existing firefighting fleet by potentially providing Victoria with an additional capability to build retardant lines in remote areas and to provide fire suppression on the flanks of bushfires. Features include:

- Capacity to drop water, foam and retardant. It cannot use sea water. Reclaimed water is used whenever possible.
- Filled by hoses while on the ground in the same way that other fixed-wing fire fighting aircraft are filled. The plane can land, refuel, reload and be ready to take-off again in approximately 30 minutes, depending on circumstances.
- Minimum flying altitude of 300 feet above ground level. Its minimum drop speed is approximately 150 knots.
- It can be anywhere in Victoria within one hour.
- The DC-10 complements other aircraft that were contracted for the fire season in Victoria. This includes two Erikson Aircranes and two Sikorsky S61s.

The Firebird 376

The Firebird 376 is a Sikorsky S76B helicopter that has been outfitted with technology that makes it one of the most advanced fire fighting data gathering tools in the world. The aircraft has been engaged to assist the Bushfire CRC evaluation component of the operational trial of the Very Large Aerial Tanker. Features include:

- 150 Knot (278 km) cruise speed
- EFIS (Electronic Flight Instrument System) glass cockpit
- Standard category passenger transport helicopter
- Aircraft can be fitted with agency radio system
- 9" Axsys V9MS HD Stabilised gimble system
- 12.1" High Definition screen in the front
- 26" High Definition screen in the back
- 2 HD Digital Video Recorders – record both color and IR 100% of the time
- AeroComputers Ultichart 5100 mapping system capable of sending screenshots and shape files down in real time
- Momentum live video downlink



and how it performs under Victorian conditions.

"For example, whether the fire retardant can actually penetrate through the eucalypt forest canopy, which is very different to the tree canopy in North American pine forests," Waller said. "That research will inform future decision making about aerial firefighting resources in Victoria."

Part of the assessment of the DC10 includes the use of one of the most sophisticated data collection helicopters in the world. The Firebird 376 is a Sikorsky S76B helicopter that can cruise at 150 knots and has been outfitted with the latest high definition colour and infrared stabilised cameras.

Dr Richard Thornton, Research Director and Deputy CEO of the Bushfire CRC, said the helicopter has two Sony high definition digital video recorders that record HD colour and infrared simultaneously over the entire duration of the flight. The S76, fitted with the necessary monitoring equipment, was imported from Canada to accompany researchers and record data with confidence.

"The Firebird 376 has a mapping system that is capable of recording and sending fire perimeter data and screenshots to fire control centres in real time," Thornton said. "Video is downlinked in real time using a Momentum Technologies M-View downlink system, and video is broadcast to a secure site on the internet for viewing via computers and BlackBerry or iPhone handheld devices."

With such advanced technological capability being tested, other Australian states are taking a keen interest in the project.

"The VLAT project is a very significant initiative," Waller said. "Regardless of whether the trial is successful or not, the evidence gained will help inform the shape the State, and perhaps even the national, aerial firefighting future."

APF

Editor's note: Tony Homfray of Victoria's Department of Sustainability and Environment and the Country Fire Authority (VIC) contributed to this report.



INTERSCHUTZ

DER ROTE HAHN

INTERNATIONAL EXHIBITION FOR RESCUE, FIRE
PREVENTION, DISASTER RELIEF, SAFETY, SECURITY
LEIPZIG 7 - 12 JUNE 2010

See you in hall 4!

Safety creates trust **ZIEGLER-AFFR Truck Z8**



Hamburg International Airport has recently renewed its complete fleet of AFFR vehicles and is now building on the operational power and reliability of four ZIEGLER-AFFR trucks Z8, all of them with high reach extension telescopic boom (HRET). Thus the latest extinguishing and rescue technology is applied which fulfils all present and future requirements for fire safety on airports and additionally allows tailor-made solutions.



we provide safety

Albert Ziegler GmbH & Co. KG • MANUFACTURERS
OF FIRE SERVICE VEHICLES, PUMPS AND HOSES

P. O. BOX 16 80 • 89531 Giengen • Germany
Memminger Str. 28 • 89537 Giengen • Germany
Phone: +49 7322 951 0 • Fax +49 7322 951 464
E-Mail: export@ziegler.de • www.ziegler.de

Foam Concentrates and Foam Systems for all applications



Meet us at Interschutz 2010 - Stand C33 in hall 5



DAFO FOMTEC AB P.O. Box 683 SE-135 26 Tyresö Sweden

Phone: +46 8 506 405 66 Fax: +46 8 506 405 29
E-mail: info@fomtec.com Web: www.fomtec.com

F-601B and F-603B achieved 15% better extinguished times than other agents on the Williams "plunge" test. These new, high-performance AR-AFFF formulations exhibit a lower viscosity than most conventional AR-AFFs and offer improved rim sealing for storage tank applications.



Next-Evolution AR-AFFF

Chemguard and Williams Partner to Improve the Performance and Expand the Applications of Fire-Fighting Foam Concentrates

The introduction of ThunderStorm F-601B 1x3 alcohol-resistant aqueous film-forming foam (AR-AFFF) and Thunderstorm F-603B 3x3 AR-AFFF in late 2009 signaled a next-evolution advancement in AR-AFFF technology.

By John Vieweger

Vice President, Sales & Marketing,
Chemguard Fire
Suppression Division

The results of a recent partnership of Chemguard and Williams Fire & Hazard Control, F-601B and F-603B exhibit significant improvements in effectiveness and efficiency and exceed the highest performance standards in the industry. Characterized by improved burnback resistance and high extinguishment speed, even on high-octane gasoline, these new AR-AFFF formulations have a lower viscosity than most conventional AR-AFFs.

Chemguard – a global leader in manufacturing foam concentrates and foam systems – and Williams Fire & Hazard Control – a world expert in flammable liquid fire suppression – are uniquely suited to advance foam concentrate technology. Williams brings unmatched expertise in flammable liquid fire fighting, while Chemguard contributes years of experience in foam concentrate R&D and

manufacturing, including the development and production of the fluorochemical surfactants used to formulate fire-fighting foam concentrates. As privately held companies, Chemguard and Williams are able to react to market situations quickly; as Texas-based companies with a deep history in the fire-fighting industry, Williams and Chemguard enjoy a sense of "local" cooperation.

AR-AFFF – the agent of choice

AR-AFFF can effectively knock down, control, and extinguish Class B hydrocarbon fuel fires (diesel, gasoline, kerosene, etc.) and polar solvent, water-miscible, fuel fires (alcohol, ketones, methanol, MTBE products, etc.). AR-AFFF also suppresses the hazardous vapors emitted from the fires and spills of both hydrocarbon and polar solvent fuels. The agent of choice in many municipal and industrial

Containing special fluorochemical and hydrocarbon surfactants, F-601B and F-603B AR-AFFF offer performance improvements for knocking down, controlling, and extinguishing both hydrocarbon and polar solvent fuel fires, as well as for controlling vapors from fires and spills of these substances. A "next-evolution" in foam concentrates, these new fire-fighting agents far exceed current industry performance standards.



fire-fighting scenarios, AR-AFFF is used in challenging applications worldwide – from protecting lives and property at flammable liquid storage facilities to petrochemical/energy complexes, warehouses, transportation/freight facilities, airports, and off-shore structures.

Traditionally, AR-AFFF foam concentrates have been designed for use on both hydrocarbon fuels as well as polar solvent fuels. Over the years we have learned that the presence of polysaccharide gums and other stabilizers in AR-AFFF formulations, which are needed for these agents to be effective on polar solvent fuels, also offer benefits on hydrocarbon fuels, such as increased foam

acetone, methyl ethyl ketone, various esters, and various ethers. Ethanol plants, which are being constructed in many locations, represent an emerging application need for AR-AFFF foam concentrates. Importantly, with ethanol expanding as a fuel for automobiles – including E-85 – AR-AFFF foam concentrates will be required by municipal fire departments, since conventional AFFF for the most part is ineffective on E-85.

Taking AR-AFFF to the next level

The "next evolution" AR-AFFF formulation was developed with performance as the number one priority. Williams and Chemguard demanded that

Most foam concentrate manufacturers use a combination of fluorosurfactants, hydrocarbon surfactants, inorganic salts, corrosion inhibitors, water, and solvents in their fire-fighting foam concentrates. The key components are fluorosurfactants, which affect film formation, fire control effectiveness, and extinguishment speed.

stability, increased water retention in the foam, increased effectiveness in creating vapor seals against hot steel surfaces, and increased resistance to reignition of the fuel. Because of its extended foam life and positive rim seal characteristics, AR-AFFF excels on large hydrocarbon fires, especially large flammable storage tank fires. Also, the huge increase in the production of blended fuels has dramatically increased the demand for AR-AFFF concentrates in recent years.

AR-AFFF foam concentrates are used in foam systems in facilities that manufacture and refine a variety of polar solvent fuels, such as isopropanol,

F-601B and F-603B far exceed current industry performance standards. In addition, Williams and Chemguard insisted that these new fire-fighting agents give superior results on the Williams "plunge" test, a challenging live fire test created by Williams to meet the stringent requirements of storage tank fire fighting.

Most foam concentrate manufacturers use a combination of fluorosurfactants, hydrocarbon surfactants, inorganic salts, corrosion inhibitors, water, and solvents in their fire-fighting foam concentrates. The key components are fluorosurfactants, which affect film formation, fire control

PARTNERS



CHEMGUARD

THE GLOBAL LEADER IN FLUOROSURFACTANT AND FOAM CONCENTRATE TECHNOLOGY
AND

WILLIAMS FIRE & HAZARD CONTROL

THE GLOBAL LEADER IN FLAMMABLE LIQUID FIRE FIGHTING

Chemguard now manufactures the complete line of Williams ThunderStorm[®] and T-STORM[®] products, including the premiere fire-fighting foam concentrate, F-601B 1x3 AR-AFFF.

www.chemguard.com

www.williamsfire.com

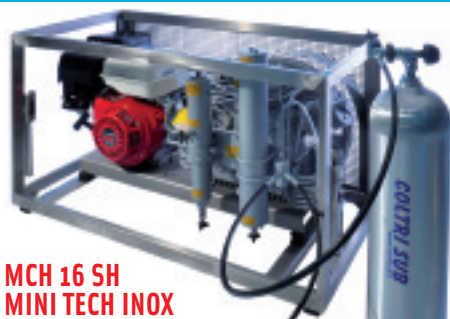


PURE BREATHING COMPRESSED AIR DEPENDABLE TECHNOLOGY



MCH 30 SILENT WITH DRIER

500 Lt/min - 18 CFM, Fully automated, Stationary filling station, The refrigerated air drier extends filtration media lifespan 6 times



MCH 16 SH MINI TECH INOX

265 Lt/min - 9.5 CFM, Light weight, Highly reliable, Portable station, Marine grade, Stainless steel frame, Also available with diesel and electric drive



MCH 6 SH

Ultraportable 100 Lt/min - 3.5 CFM, Small compressor only 37 Kg, Also available with single and triphase 3 Kw electric drive

Coltri Asia Pacific Co., Ltd.

Free Zone at 304 Industrial Park 2 No. 94/5, Moo. 3, T. Khao Hin Sorn - A. Phanomsarakarm, Chachoengsao 24120 Thailand

Tel: + 66 38 855 103 to 5 Fax: + 66 38 855 106

mobile +66 81 8913937

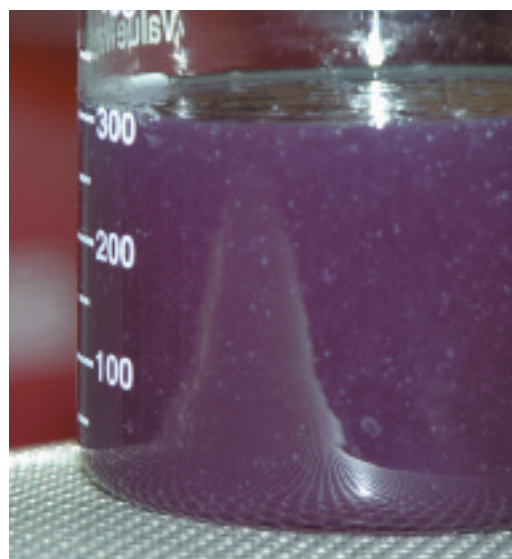
c.benelli@aerotecnicacoltriasiapacific.com

www.aerotecnicacoltriasiapacific.com



effectiveness, and extinguishment speed. Without highly effective and efficient fluorochemicals, film-forming foam concentrates cannot meet – let alone exceed – today's fire standards.

Chemguard formulated F-601B and F-603B from special fluorochemical and hydrocarbon surfactants, high-molecular-weight polymers, and solvents. These advanced AR-AFFF foam concentrates have a much lower viscosity than many 1x3 and 3x3 AR-AFFF products, which enhances their performance in foam proportioners, in-line eductors, balanced-pressure systems, and other





equipment. Chemguard fluorochemicals also give F-601B and F-603B a much needed edge in film formation properties and rim sealing characteristics.

Validating AR-AFFF improvements

To validate the formulation improvements, the new AR-AFFF foams went through some of the most rigorous live fire tests in the industry at Chemguard's onsite Fire Test Facility, including custom tests developed by Williams. Fire test criteria included:

- UL testing: Obtained a ¾% listing on hydrocarbon fires for F-601B, a 1% listing on hydrocarbon fires for F-603B, and a 0.10 gpm/ft² (4.07 lpm/m²) application rate on isopropyl alcohol for both agents.
- EN 1568 testing: Received a "1A" rating (the highest rating) on both hydrocarbon fuels and polar solvent fuels.
- LASTFIRE testing: Achieved performance level "good" for all nozzles in both fresh water and salt water (except the system nozzle with a saltwater premix, where F-601B achieved performance level "acceptable").
- Williams "plunge" test: Documented 15% better extinguishment times than any other available products.

The primary advancements of the new AR-AFFF formulations include dramatically reduced viscosity, superior burnback resistance, and exceptional extinguishment speed on high octane gasoline. In addition, the expanded foam stays wet and fluid on fuel surface in the finished foam state.

The advanced F-601B and F-603B AR-AFFF formulations offer improved rim sealing for storage tank applications using salt water solutions, longer foam life, and better water retention, which leads to improved resistance to reignition and fire fighter safety.

F-601B and F-603B are fully compatible with current ThunderStorm reserves.

Future foam concentrate advancements

Chemguard and Williams are committed to continue development of "next-evolution" foam concentrates. The fluorochemical R&D and foam technology advances reflected in these AR-AFFF products are being applied to other Chemguard-manufactured fire-fighting agents. Our partnership is allowing us to work more effectively to develop fire-fighting agents that can help save lives and protect property, while maintaining an acceptable environmental footprint.

APF

Dr Sthamer – Hamburg

**Moussol APS LV
Low Viscosity AR-AFFF
Fire Fighting Foams
Specially Developed for
Ethanol Risks,
Refineries & Storage Facilities**

**FOAM
FIGHTS
FIRE**

Proven Reliability.

**24/7 Emergency Supplies
from Stock**

Synthetic Foams

- Moussol APS
- Moussol FF **NEW!**
- Sthamex AFFF
- Sthamex
- Sthamex class A

Protein Foams

- Fluor-Foamousse
- Foamousse FFFP
- Foamousse OMEGA
- Foamousse

Ready To Use Foams

- Fettec
- Mousseal-C
- Mousseal-CF
- Mousseal-ATC

Training Foams

**24/7
EMERGENCY
SUPPLIES
+49 40 73616 80**

We offer a comprehensive range of high performance and environmentally friendly foams.



Dr. STHAMER HAMBURG

Head Office and Factory Hamburg
Liebigstrasse 5 · D-22113 Hamburg
Phone +49 40 736168-0
Telefax +49 40 736168-60
E-Mail: info@sthamer.com · www.sthamer.com

International Sales Contact
Mr. Jan Knappert
Phone +44 (0) 7795 101770
E-mail: jknappert@sthamer.com



Distributor and Representative Offices

BAUER COMPRESSORS

BANGLADESH

BIZZSAFE ENTERPRISE PTE LTD

192/1 East Kafrul, Dhaka Cantonment, Dhaka 1206, Bangladesh

Contact: Mr Gupta
Tel: 88 0 2 875 0010 or 9198 202 98969

Fax: 88 0 2 871 4400

Email: biz2save@gmail.com

Dealer/Distributor

BRUNEI

BAUER COMPRESSORS ASIA PTE LTD

2 Penjuru Place, #01-05 Penjuru Tech Hub
Singapore 608783

Contact: Mr Stephen Hines (Managing Director)

Tel: +65 6271 6271 Fax: +65 6272 3345

Email: info@bauer-compressors.com.sg

Bauer Subsidiary Office

FRENCH POLYNESIA

TAHITI SPORT

PO Box 62, 98713 Papeete

Tahiti, French Polynesia

Contact: Mr Thierry Alberola

Tel: +689 505959 Fax: +689 421775

Email: plongee@tahiti-sport.pf

Dealer/Distributor

INDONESIA

MARINE & INDUSTRIAL COMPRESSORS

304 Thomson Road, Singapore 307654

Contact: Mr Sng

Tel: +65 6250 6018 Fax: +65 6253 8443

Email: masmarin@singnet.com.sg

Dealer/Distributor

KOREA

TECKO CO LTD

2F, SK@Technopark, Mega-Dong

190-1 Sangdaewon-Dong, Sungnam-City

Kyungki-Do 462 807, Korea

Contact: Mr K Y Lee

Tel: +82 31 776 2442 Fax: 82 31 776 2444

Email: kylee@tecko.co.kr

Dealer/Distributor

MALAYSIA

SK CRYOGENICS SDN BHD

No. 16 Jalan Anngrik Mokara 31/52, Section 31, Kota

Kemuning, 40460 Shah Alam, Selangor, Malaysia

Contact: Mr Steve Kellett

Tel: +60 3 5122 4269 Fax: +60 3 5122 4235

Email: steve@skcryogenics.com

Dealer/Distributor

PAKISTAN

ALPINE INDUSTRIALCON PVT LTD

305/2 G.T. Road, Baghbanpura, Lahore, Pakistan

Contact: Mr Kashif Ahmad

Tel: +92 42 685 2313 Fax: +92 42 655 3674

Email: alpinelahore@hotmail.com

Dealer/Distributor

PHILIPPINES

CEBU ERNBRI IMPORT INC/

AQUAVENTURE WHITETIP DIVE SUPPLY

Ermitta Office: Unit 101 Joncor II Bldg, #1362 A. Mabini

Street, Ermitta Manila Philippines 1000, Philippines

Contact: Mr Brian L Giles

Tel: +632 521 0433 Fax: +632 522 1165

Email: brian@aquaventurewhitetip.com

Dealer/Distributor

SINGAPORE

BAUER COMPRESSORS ASIA PTE LTD

2 Penjuru Place

#01-05 Penjuru Tech Hub

Singapore 608783

Contact: Mr Stephen Hines (Managing Director)

Tel: +65 6271 6271

Fax: +65 6272 3345

Email: info@bauer-compressors.com.sg

Bauer Subsidiary Office

MARINE & INDUSTRIAL COMPRESSORS

304 Thomson Road

Singapore 307654

Contact: Mr C H Sng

Tel: +65 6250 6018

Fax: +65 6253 8443

Email: masmarin@singnet.com.sg

Dealer/Distributor

SRI LANKA

HALCHEM LANKA PVT LTD

No 7, Siri Dhamma Mawatha, Colombo 10, Sri Lanka

Contact: Mr Cyril Halloluwa Managing Director

Tel: +94 11 5843213 and 5843219 (Direct)

Fax: +94 11 2674 615 and 2792 406

Email: cyril.halloluwa@halchem-lanka.com

Website: www.halchem-lanka.com

Dealer/Distributor

TAIWAN

MING SHEN ENTERPRISE CO LTD

5, PaShih 1 Street, DanShui Town

Taipei, Taiwan 25170, Taiwan

Contact: Mr Tom Tseng

Tel: +886 (2) 2809 5789 Fax: +886 (2) 2809 6189

Email: tom@3arrow.com.tw

Dealer/Distributor

THAILAND

INTER SOL ENGINEERING & TECHNOLOGY PTE LTD

7/288 Moo 6, Chaengwattana Road

Bhanmai, Pakkred, Nonthaburi 11120, Thailand

Contact: Mr Nathanan

Tel: +66 2 9808754 Fax: +66 2 9808753

Email: nathanan@intersol.th.com

Dealer/Distributor

VIETNAM

FRANCO-PACIFIC VIETNAM CO LTD

55 Ho Hao Hon Street

District 1, Ho Chi Minh City, Vietnam

Contact: Mr Colm Minogue

Tel: +84 8 836 0257 Fax: +84 8 836 1387

Email: colminogue@francopacific.com

Dealer/Distributor

MEKONG SCUBA SUPPLY LTD

2/14 Cao Thang Street

District 3, Ho Chi Minh City, Vietnam

Contact: Mr Mike Doyle

Tel: +848 832 8952 Fax: +848 832 8650

Email: mikedoyle44@hotmail.com

Dealer/Distributor

BLACK DIAMOND

CHINA

SHANGHAI ZANRAY INDUSTRIAL CO LTD

4F, No.88 Jianyun RoadZhoupu Town, Zhoupu Town,

Nanhui District, Shanghai 201318, China

Contact: Mr Andy Yu

Tel: +86 2151388798 Email: info@zanray.cn

TAIWAN

JIUH WAN ENTERPRISE CO LTD

1F, No.335, Sec.1, Hsi An Rd., Pei Mei Terrace

Pu Li Chen, Nan Tou Hsien 555, Taiwan

Tel: +886 492899101 Email: jiu.h.wan@msa.hinet.net

THAILAND

GLOFAB CO LTD

46/20 MOO9, Ramkhamhaeng Road

Sapan Soong, Bangkok 10240, Thailand

Contact: Mr Ramesh Tiwari

Tel: +66 29275911 Email: ratiwari@ksc.th.com

REST OF ASIA

BLACK DIAMOND GROUP INC

c/o AMG International Limited

Room 1603 Wing Kwok Centre

182 Woosung Street, Jordan, Kowloon, Hong Kong

Contact: Mr Alan Lunder

Tel: +1 (617) 527-3312 Email: alunder@bdfire.com

BRISTOL UNIFORMS

AUSTRALIA

PAC FIRE AUSTRALIA (formerly Pacific Helmets Australia)

Unit 1, 28 Burnside Road, Hallmarc Business Park

Yatala Qld 4207, Australia

Tel: +61 7 3441 7100 Fax: +61 7 3441 7177

Email: sales@pacfire.com.au

Website: www.pacfire.com.au

Dealer/Distributor

BANGLADESH

MANIK BROTHERS

Hai Mansion (3rd Floor), 9/3 Motijheel Circular Road

Dhaka - 1000, Bangladesh

Contact: Mr A K Bhowmick

Tel: +880 2 7100 589 Fax: +880 2 7100 386

Email: manikbrs@1postbox.com

Dealer/Distributor

BRUNEI

DASAPREM (M) SDN BHD

10 & 12 Jalan Muara 8/9, 40000 Shah Alam

Selangor, Darul Ehsan, Malaysia

Contact: Mr Prem R Murthy

Tel: +603 550 9060 Fax: +603 550 4486

Email: dasaprem@yahoo.com

Website: www.dasaprem.com

Dealer/Distributor

YEN LEE FIREWELD PTE LTD

18 Penhas Road, 208182, Singapore

Tel: +65 62909890 Fax: +65 62961444

Email: jeffrey@fireweld.com.sg

Dealer/Distributor

CHINA

SHENZHEN RUFN INDUSTRIAL CO LTD

RM-701, 7/F Leaser Tower

1st Fuhua Rd, Shenzhen, China

Contact: Amy Jin

Tel: +86 755 8399 9581 Fax: +86 755 8399 9548

Email: wj@rnf88.com

Dealer/Distributor

FIJI

PHILLIPS & SMITH LTD

10 Akatea Road, Glendene, Auckland, New Zealand

Contact: Mr S Hampton

Tel: +649 818 8048 Fax: +649 818 4484

Email: stuart@firemaster.co.nz

Website: www.firemaster.co.nz

Dealer/Distributor

HONG KONG

CHUBB HONG KONG LTD

3 Hok Yuen Street East

Hung Hom, Kowloon, Hong Kong

Contact: Mr Simon Tsang

Tel: +852 2746 9628 Fax: +852 2785 0849

Email: simonsft.chubb.com.hk

Website: www.chubb.com.hk

Dealer/Distributor

INDIA

FOREMOST MARKETING PVT LTD

M-1 Green Park Extn, New Delhi 110016, India

Contact: Mr Vinay Khanna

Tel: +91 11 261 969 82 Fax: +91 11 261 669 61

Email: foremost@vsnl.net

Website: www.foremostsafety.com

Dealer/Distributor

JAPAN

ABLE-YAMAUCHI CO LTD

Yokohama Nishiguchi, SIA Building

10-36 Kitasaiwai, 2-Chome Nishi-Ku

Yokohama 220-0004, Japan

Contact: S Yamauchi

Tel: +81 45 312 1130 Fax: +81 45 312 1350

Email: emiko@able-yamauchi.co.jp

Website: www.able.yamauchi.co.jp

Dealer/Distributor

MALAYSIA

DASAPREM (M) SDN BHD

10 & 12 Jalan Muara 8/9, 40000 Shah Alam

Selangor Darul Ehsan, Malaysia

Contact: Mr Prem R Murthy

Tel: +603 550 9060 Fax: +603 550 4486

Email: dasaprem@yahoo.com

Website: www.dasaprem.com

Dealer/Distributor

EAST MALAYSIA

YEN LEE FIREWELD PTE LTD

18 Penhas Road, 208182, Singapore

Tel: +65 62909890 Fax: +65 62961444

Email: jeffrey@fireweld.com.sg

Dealer/Distributor

NEW ZEALAND

PHILLIPS & SMITH LTD

10 Akatea Road, Glendene, Auckland, New Zealand

Contact: Mr S Hampton

Tel: +649 818 8048 Fax: +649 818 4484

Email: stuart@firemaster.co.nz

Website: www.firemaster.co.nz

Dealer/Distributor

SINGAPORE

YEN LEE FIREWELD PTE LTD

18 Penhas Road, 208182, Singapore

Tel: +65 62909890 Fax: +65 62961444

Email: jeffrey@fireweld.com.sg

Website: www.fireweld.com.sg

Dealer/Distributor

SRI LANKA**FIRETECH (PRIVATE) LTD**

34 Walter Gunesekara Mawatha, Nawala, Sri Lanka
 Contact: Leon Daniels Tel: +94 11 4410588
 Fax: +94 11 2806666 Email: firetech@pan.lk

Dealer/Distributor**TAIWAN****SHENG-TAI FIRE PROTECTION INDUSTRIAL CO LTD**

No 222-2 Sec2, Cheng Tai Rd, Wu-Ku Shiang
 Taipei, Hsien, Taiwan
 Contact: Liu Yuan Hung Tel: +886 22292 1751
 Fax: +886 22291 1984 Email: sato@mail.mold.net.tw
 Website: www.shengtai.com.tw

Dealer/Distributor**VIETNAM****TRAN VU TRADING CO LTD**

61 Ban Co Street, District 3, Hochiminh City, Viet Nam
 Contact: Tran Vu Hong
 Tel: +84 88325101 Fax: +84 88309586
 Email: sales@tranvufire.com
 Website: www.tranvufire.com

Dealer/Distributor**COLTRI ASIA PACIFIC****CHINA****SHANGHAI AND SOUTHERN CHINA:****SHANGHAI PANNY TRADING CO LTD**

3F, #17-2 No.230, Xijinqiao Rd., Pudong new area,
 Shanghai China
 Contact: Mr Todd
 Tel: +86-21-50321062 Fax: +86-21-50321063
 Email: panny-ye@hotmail.com
 Website: www.coltrisub-china.com

Dealer/Distributor**HONG KONG AND MACAU****WAH SHING COMPANY**

No. 2B-2C, G/F, Larch Street, Tai Kok Tsui,
 Kowloon, Hong Kong SAR
 Contact: Miss Jackio Kwok
 Tel: +852 2391 3997, +852 2391 4084
 Fax: +852 2789 4638
 Email: wahshingcompany@gmail.com

Dealer/Distributor**INDIA****JYO TECH ENGINEERING & MARKETING**

H-49 A, Kalkaji, New Delhi 110019 India
 Tel: +91 (11) 26447966 Fax: +91 (11) 26482189
 Email: jyotech@del3.vsnl.net.in

Dealer/Distributor**INDONESIA****DIVEMASTERS INDONESIA JAKARTA**

Jl. Bangka Raya No.39A Jakarta 12720 Indonesia
 Tel: +6221 7199045 Fax: +6221 7198974

Dealer/Distributor**BALI**

Jl. By Pass I Gusti Ngurah Rai No. 314 Sanur, Denpasar
 80228 Bali, Indonesia
 Tel: +62361 283138 Fax: +62361 285736
 Email: sales@divemasters.co.id

Dealer/Distributor**LAUTAN MAS**

Jl. Toko Tiga No. 24 Jakarta 11230 Indonesia
 Tel: +62 (0) 21 690-1333 Fax: +62 (0) 21 690 2479
 Email: info@lautanmas.com
 Website: www.lautanmas.com

Dealer/Distributor**MALAYSIA****RAINBOW RUNNER S/B**

383D Jln Ampang 50450 Kuala Lumpur Malaysia
 Tel: +60 (03) 42514368 or 42515368
 Fax: +60 (03) 42511268
 Branch: 3.06, Plaza Berjaya Jln Imbi 55100 Kuala Lumpur
 Malaysia
 Tel: +60 (03) 21414587 Fax: +60 (03) 21487440
 Website: www.rainbowrunner.net

Dealer/Distributor**MALDIVES****MARKETECH MALDIVES PVT LTD**

M.Iramaa, 1st Floor, Fareedhi Magu, Rep of Maldives
 Tel: +(960) 3331911 Fax: +(960) 3318815
 Email: ahmed@marketechmaldives.com

Dealer/Distributor**NEW ZEALAND****AIR TECHNOLOGY LTD**

5/20 Constellation Drive, Mairangi Bay 0632 Auckland
 PO Box 305065 Triton Plaza, North Shore Auckland 0757
 New Zealand
 Contact: Ross Irvine
 Tel: 64-9-478 9995 Fax: 64-9-478 6221
 Website: www.divecompressors.co.nz

Dealer/Distributor**PHILIPPINES****AQUAMUNDO SPORTS INC**

G/FVernida I Bldg., 120 Amorsolo St. Legaspi Village,
 Makati City, Philippines 1229
 Tel: (+632) 813-AQUA (2782) (+632) 817-AQUA (2782)
 Fax: Dial Local 13
 Email: info@aquamundosports.com,
 scuba@aquamundosports.com

Dealer/Distributor**SINGAPORE****ALLROUND ADVANCED TECHNOLOGIES PTE LTD**

105 Sims Ave #03-06 Chancerylodge Complex
 Singapore 387429
 Tel: +65 749 2778 Fax: +65 749 2977
 Email: enquiry@allround.com.sg

Dealer/Distributor**KOREA, REPUBLIC OF****DAE WOONG SUITS CO LTD**

1614-15, Seocho-Dong, Seocho-Ku, Seoul, Korea.
 Tel: 82-2-588-0970 Fax: 82-2-587-0392
 Email: mares@mares.co.kr
 Website: www.mares.co.kr

Dealer/Distributor**TAIWAN****NELVEN CO LTD**

14F-6, No. 76, Sec. 1, Fu-Shings South Rd
 Taipei City 106, Taiwan
 Tel: (886) 2-2721-9770 Fax: (886) 2-8773-2047
 Email: nelven@ms18.hinet.net
 Website: www.nelven.com.tw

Dealer/Distributor**THAILAND, VIETNAM, CAMBODIA, SRI LANKA****SIAM DIVING ENTERPRISES ASIA PACIFIC CO LTD**

No.12, Chaloemprakit Ratchakan Thi 9 Road, Soi 48,
 Dokmai, Prawet, Bangkok, 10250, Thailand
 Tel: +66 2 726-6101-5 Fax: +66 2 726-6106
 Email: c.benelli@aerotecnicacoltriasiapacific.com,
 sdesystems@csloxinfo.com
 Website: www.aerotecnicacoltriasiapacific.com

Dealer/Distributor**VIETNAM****SCUBA SUPPLY**

120/54a Nguyen Thien Thuat Street, Nha Trang, Vietnam
 Tel: +84 (0) 914 029 790 Fax: +84 (0) 58 252 0576
 Email: craig@scubavietnam.com
 Website: www.scubavietnam.com

Dealer/Distributor**CUTTERS EDGE****AUSTRALIA****KDW CONSULTING LLC**

3023 Sonoma Way, Viera, FL 32955, USA
 Contact: Kenton D Warner
 Tel: 321 636 4543 Fax: 928 438 6382
 Email: kenwarner@att.net
 Website: www.cuttersedge.com

Representative Office**CHINA****ANCOM**

Building 5, Courtyard 10 Village
 Middleroad, North 3rd Ring Road
 Contact: Pei Zhang
 Tel: 86 10 6202 2792 Fax: 86 10 6207 7929
 Email: hung.fang@utoronto.ca
 Website: www.ancom.cn/www.cuttersedge.com

Dealer/Distributor**NORLAN ENTERPRISES INC**

Room 952, #218 Tang Li Road, China
 Contact: Helen Wang
 Tel: 86 10 8467 3721/8467 3722
 Fax: 86 10 8467 3770 Email: helenwang@norlan.cn
 Website: www.norlan.cn/www.cuttersedge.com

Dealer/Distributor**WUXI NEW FIRETRE SAFETECH LTD**

Block 3, Long Shan Wen Bo Industrial Park
 Qian Yao Road, Hu Bin District
 Wuxi, Jiangsu Province, PRC 214151
 Tel: +86 510 8581 5085
 Fax: +86 510 8275 4257
 Email: mail@wfs.com.cn
 Website: www.wfs.com.cn

Dealer/Distributor**INDIA****ASKA EQUIPMENTS LTD**

Aska House, 193 Deepali, Deepali Chowk, Outer Ring
 Road – Pitampura, New Delhi 110 034, India
 Contact: Navdeep Garq
 Tel: 91 11 27014416/27014417
 Fax: 91 11 27014413 Email: info@askagroup.com
 Website: www.askagroup.com/www.cuttersedge.com

Dealer/Distributor**ISRAEL****OFFER FIRE RESCUE & SALVAGE LTD**

Binyamina 30500, Israel
 Contact: Ofer Halamish
 Tel: 972 4 6288444 Fax: 972 4 6288555
 Email: offer@ofer.co.il
 Website: www.ofere.co.il/www.cuttersedge.com

Dealer/Distributor**JAPAN****TEIKOKU SEN-I CO LTD**

5-13, 2 Chome, Nihonbashi, Chuo-Ku, Tokyo 103, Japan
 Tel: 81-3-3281-3026 Fax: 81-3-3274-6397
 Email: teisen-tyo@teisen.co.jp
 Website: www.teisen.co.jp/www.cuttersedge.com

Dealer/Distributor**KOREA****KDW CONSULTING LLC**

3023 Sonoma Way, Viera, FL 32955, USA
 Contact: Kenton D Warner
 Tel: 321 636 4543 Fax: 928 438 6382
 Email: kenwarner@att.net Website: www.cuttersedge.com

Representative Office**MALAYSIA****CITO MARKETING, SDN BHD**

No. 11, Jalan SS15/4B, Subang Jaya
 47500 Petaling Jaya
 Selangor, Darul Ehsan
 Contact: Ahmad Nazmi Abu Raihan
 Tel: +603 5631 1286 Fax: +603 5634 0583
 Email: info@citogroup.com.my
 nazmi@citogroup.com.my/www.cuttersedge.com

Dealer/Distributor**PHILIPPINES****KDW CONSULTING LLC**

3023 Sonoma Way, Viera, FL 32955 USA
 Contact: Kenton D Warner
 Tel: 321 636 4543 Fax: 928 438 6382
 Email: kenwarner@att.net
 Website: www.cuttersedge.com

Representative Office**SINGAPORE****KDW CONSULTING LLC**

3023 Sonoma Way, Viera, FL 32955 USA
 Contact: Kenton D Warner
 Tel: 321 636 4543 Fax: 928 438 6382
 Email: kenwarner@att.net Website: www.cuttersedge.com

Representative Office**SOUTH KOREA****JINUTEC INTERNATIONAL DIVISION**

711 Visiontop Officetel 374-4
 Won-Dong, Osan-City, South Korea
 Contact: Na Hae-Yul
 Tel: 82 31 375 8558 Fax: 82 31 375 4884
 Email: hyna@jinutec.com
 Website: www.jinutec.com/www.cuttersedge.com

Dealer/Distributor**THAILAND****KDW CONSULTING LLC**

3023 Sonoma Way, Viera, FL 32955 USA
 Contact: Kenton D Warner
 Tel: 321 636 4543 Fax: 928 438 6382
 Email: kenwarner@att.net
 Website: www.cuttersedge.com

Representative Office**DRÄGER****AUSTRALIA****DRAEGER SAFETY PACIFIC**

Axxess Corporate Park, Unit 99, 45 Gilby Road
 Mount Waverley, Victoria 3149
 Tel: +61 3 9265 5000 Fax: +61 3 9265 5097
 Email: customer.service@draeger.com

Representative Office**CHINA****BEIJING FORTUNE DRAEGER SAFETY EQUIPMENT CO LTD**

Yu An Lu 22, B Area
 Beijing Tianzhu Airport Industrial Zone
 Shunyi District, Beijing, 101300
 Tel: +86 10 8049 8000 Fax: +86 10 8049 8005
 Email: sales.safety.cn@draeger.com

Representative Office**INDIA****JOSEPH LESLIE DRAEGER MFG PVT LTD**

Leslico House, Prof. Agashe Road
 Off 87-C, Bhavani Shankar Road
 Dadar (West), Mumbai 400028
 Tel: +91-22-2422 1880/1878/7198
 Fax: +91-22-2430 3705
 Email: mumbai@lesliedraeger.com

Representative Office

INDONESIA**PT DRAEGERINDO JAYA**

Beverly Antasari Building
Jl. Pangeran Antasari No. 67, Unit L
Cilandak Barat, Jakarta, Selatan 12430
Tel: +6221 751 3289 Fax: +6221 751 2052
Email: product_support@draeger.co.id

Representative Office**JAPAN****DRAEGER SAFETY JAPAN LTD**

3-8-1 Toyo Koto-ku
Tokyo, Japan, Japan Zip 135-0016
Tel: +81 3 44 615111 Fax: +81 3 44 615100
Email: sales.safety.jp@draeger.com

Representative Office**KOREA****DRAEGER SAFETY ASIA**

Daejeong Bld. #1106
Bang-l-dong, Songpa gu
Seoul, Korea
Tel: +82 2 6415 8222 Fax: +82 2 6415 8223
Email: sdseo3@magincn.com

Representative Office**MALAYSIA****DRAEGER SAFETY ASIA PTE LTD**

No. 14, Jalan PJS 11/18, Bandar Sunway 46150
Petaling Jaya, Malaysia
Tel: +60 3 5635 6460 Fax: +60 3 5635 4171
Email: dsa.malaysia@draeger.com

Representative Office**NEW ZEALAND****DRAEGER SAFETY PACIFIC PTE LTD**

Unit O, No. 150
Harris Road, East Tamaki, Auckland
Tel: +649 273 3160 Fax: +649 273 3159
Email: customer.service@draeger.com

Representative Office**SINGAPORE****DRAEGER SAFETY ASIA PTE LTD**

67 Ayer Rajah Crescent #06-03
Singapore 139950
Tel: +65 6872 9281 Fax: +65 6512 1908
Email: dsa.singapore@draeger.com
Website: www.draeger.com.sg

Regional Head Office**TAIWAN****DRAEGER SAFETY TAIWAN CO LTD**

12/F, Kuohwa Building
868-5 Chungcheng Road
Chungho City
Taipei County, 235 Taiwan R.O.C.
Tel: +886 (02)2223-6388 Fax: +886 (02)2223-2258
Email: sales.taiwan@draeger.com

Representative Office**THAILAND****DRAEGER SAFETY (THAILAND) LTD**

123/20, Nonsi Road
Kwaeng Chongnonsi
Khet Yannawa
Bangkok 10120
Tel: +662 6811 781 (4 lines) Fax: +662 6811 780
Email: sales.thailand@draeger.com

Representative Office**VIETNAM****DRAEGER SAFETY ASIA PTE LTD**

No. 5, A2 Nguyen Khanh Toan Str.
Cau Giay District
Hanoi, Vietnam
Tel: +84 4 281 3463 Fax: +84 4 281 3461
Email: sales.safety.vn@draeger.com

Representative Office**FIKE****AUSTRALIA****FIRE PROTECTION TECHNOLOGIES
PTY LTD**

Unit 14, 42-44 Garden Blvd
Dingley
Victoria 3712
Australia
Tel: +61 3 9558 0715 Fax: +61 3 9558 0725
Email: Enquiries@fire-protection.com.au
Website: www.fire-protection.com.au

Dealer/Distributor**BANGLADESH****NAVANA INTERLINKS LTD**

7, Champaklal Udyog Bhavan
Sion (E) Mumbai 400 022, India
Tel: +88 02-9892911 Fax: +88 02-9895252
Email: info@navana-iv.com Website: www.navana-iv.com

Dealer/Distributor**HONG KONG****THE JARDINE ENGINEERING
CORPORATION LTD**

13/F Somerset House, Taikoo Place
979 King's Road, Hong Kong
Tel: +852 2807 4684 Fax: +852 2503 4210
Email: yick-kuen.kwong@jec.com
Website: www.jec.com

Dealer/Distributor**INDIA****NEWAGE INDUSTRIES**

Champaklal Ugyog Bhavan
Unit No. 7, Sion (East), Mumbai 100 022, India
Tel: +91 22 2407 7421 Fax: +91 22 2407 4229
Email: info@newage-india.com
Website: www.newage-india.com

Dealer/Distributor**INDONESIA****KARYA LESTARI MAKMUR PT**

Jl. Pangeran Jayakarta, 85AK, Jakarta 10730, Indonesia
Tel: +62 21 628 1933 Fax: +62 21 628 1976
Email: johnklima@cbn.net.id

Dealer/Distributor**KOREA****PARADISE INDUSTRY CO LTD**

#683-116 Hannam-Dong, Yongsan-Ku, Seoul, South Korea
Tel: +82 2 3780 8770 Fax: +82 2 3780 8772
Email: shlee@paradise-ind.co.kr
Website: www.paradise-ind.co.kr

Dealer/Distributor**MALAYSIA****FIKE ASIA PACIFIC SDN BHD**

18B, 2nd Floor, Jalan Astak L U8/L
Bukit Jelutong, 40150 Shah Alam, Selangor, Malaysia
Tel: +60 3 7859 1462 Fax: +60 3 7859 1461
Email: chun-wah.leong@fike.com
Website: www.fike.com

Representative Office**SUKIADA ENGINEERING SDN BHD**

No. 20 Jalan Astaka L U8/L, Bukit Jelutong
40150 Shah Alam, Selangor, Malaysia
Tel: +60 3 7845 2008 Fax: +60 3 7845 6008
Email: bkwong@sukiada.com.my
Website: www.sukiada.com.my

Dealer/Distributor**PAKISTAN****MGH ENGINEERING AND CONTROL
PVT LTD**

H. # 20 St., #5/A Kot Shahabdin
Shahdrah, Lahore 54950, Pakistan
Tel: +92 - 42 - 7913064 Fax: +92 - 42 - 7913064
Email: mansoorshaker@yahoo.com
Website: www.mgheng.com

Dealer/Distributor**PHILIPPINES****FIRE SOLUTIONS INC**

1028 Malaya Street, Malanday
Marikina City, 1805 Philippines
Tel: +63 2 371 9774 Fax: +63 2 374 3041
Email: firesolutions@skyinet.net

Dealer/Distributor**SINGAPORE****AZCEND ASIA PTE LTD**

Blk 21, Kallang Avenue #04-165
Singapore 339412
Tel: (65) 6299 0798 Fax: (65) 6299 3735
Email: rtiong@azcendasia.sg

Representative Office**SRI LANKA****BUILDING SERVICES (M&E) ENGINEER
INTERNATIONAL PVT LTD**

No. 20/39, Fairfield Gardens, Colombo 08, Sri Lanka
Tel: +94 11 4717 500 Fax: +94 11 2667 569
Email: bldserv@sltnet.lk

Dealer/Distributor**TAIWAN****SUNMORN INC**

7F-2, 76, Nan Jing W. Road, Taipei 10352, Taiwan
Tel: +886 2 2550 3500 Fax: +886 2 2550 5350
Email: merylyu@sunmoreinc.com
Website: www.sunmoreinc.com

Dealer/Distributor**THAILAND****ANTI-FIRE CO LTD**

316-316/1, Sukhumvit 22 Road
Klongtoey, Bangkok 10110, Thailand
Tel: +66 2 260 4565 Fax: +66 2 258 2422
Email: sithichai@antifire.com
Website: www.antifire.com

Dealer/Distributor**FIRE FIGHTING
ENTERPRISES****AUSTRALIA****AMPAC TECHNOLOGY PTY LTD**

97 Walters Drive, Perth, Australia 6017
Tel: +61 892 423 333 Fax: +61 892 423 334
Website: www.ampac.net

Dealer/Distributor**BAHRAIN****KHAYBER TRADING COMPANY**

W.L.L, PO Box No. 1976, Cr.No. 40189-01
Manama, Bahrain

Dealer/Distributor**CYPRUS****M.T. PIPERARIS TRADING LTD**

Nafpactou 19a, Lemesos 3051, Cyprus
Tel: +357 5 737311 Fax: +357 5 737310

Dealer/Distributor**ISRAEL****TELEFIRE FIRE & GAS**

Detectors Ltd, PO Box 7036
Petach-Tikva 49250, Israel
Tel: +972 3 9211955 Fax: +972 3 9211816

Dealer/Distributor**IRAN****NAR KOOB IRAN**

Apt 7, 3rd Floor, No 32, Varavini St.
Amir Atabak, St. Ostad Motahari Ave.
Tehran - Iran
Tel: +98 21 88842649 Fax: +98 21 88307405

Dealer/Distributor**KOREA****HI MAX CO LTD**

Sicox Tower, 115-Ho 513-14
Sangdaewon-Dong, Jungwon-Gu
Sungnam-City, Kyungki Do, Korea
Tel: +82 31 769 7698

Dealer/Distributor**MALAYSIA****FITTERS ENG SERVS SDN BHD**

No.1 Block C, Jalan Dataran, Sd1 Pju 9
52200 Bandar Sri, Damansara
Kuala Lumpur, Malaysia
Tel: +60 3 62767155 Fax: +60 3 62758712

Dealer/Distributor**NEW ZEALAND****AMPAC INDUSTRIES LTD**

PO Box 100-149
North Shore Mail Centre
Glenfield, Auckland
Tel: +64 94438072 Fax: +64 94438073

Dealer/Distributor**QATAR****AL SHAIBEH ESTABLISHMENT**

PO Box 3975, Doha, Qatar
Tel: +974 4322140 Fax: +974 4416650

Dealer/Distributor**SINGAPORE****ACCLAIM SYSTEMS PTE LTD**

Blk 104, Boon Keng Road, 05-01
Singapore 339775
Tel: +656 2990 798 Fax: +656 299 3735

Dealer/Distributor**ALARM SUPPLY PTE LTD**

63 Jalan Pemimpin, 03-07
Pemimpin Industrial Bldg
Singapore 577219
Tel: 00 656 258 3445 Fax: 00 656 258 6428

Dealer/Distributor**SRI LANKA****FIRETECH (PVT) LTD**

34, Walter Gunasekara
Mawatha, Nawala, Sri Lanka
Tel: +94 1 806613 Fax: +94 1 806666

Dealer/Distributor**SYRIA****ESS COMPANY**

PO Box 35478, Damascus, Syria

Dealer/Distributor**TAIWAN****HORING LIH IND CO LTD**

4f No 18 Lane 327, Chung Shan Road
Sec 2 Chung-Ho-City
Taipei Hsien, Taiwan
Tel: +886 2224 87599 Fax: +886 2224 07752

Dealer/Distributor

THAILAND**TEEYA MASTER SYSTS CO LTD**

100/101-102 Vongvanji, Building B, 30th Flr
Rama 9 Road, Huaykhwang
Bangkok 10320, Thailand
Tel: +662 2 6451130 Fax: +662 2 2488540

Dealer/Distributor**UNITED ARAB EMIRATES****NAFFCO**

PO Box 17014, Jebel Ali Free Zone Area, Dubai, U.A.E
Tel: +971 4 881 5653 Fax: +971 4 881 6229

Dealer/Distributor**TELECTRON**

PO Box 2946, Al Salam Street
Bldg. No.5, Abu Dhabi, U.A.E
Tel: +971 26795333 Fax: +971 26794609

Dealer/Distributor

HOLMATRO RESCUE EQUIPMENT

AUSTRALIA**CHUBB FIRE SAFETY LTD**

120, Silverwater Road, Silverwater, NSW 2128
Locked Bag 102, Silverwater 1811
Contact: Andrew Loftus
Tel: 1300 369 309 Fax: 02 8748 7450
Email: firesafety@chubb.com.au
Website: www.chubb.com.au

Dealer/Distributor**BRUNEI****IECS SDN BHD**

13A Simpang 544-22, Jalan Jerudong
B.S.B. Brunei Darussalam
Contact: Roger Sim
Tel: +673 2 612 717 Fax: +673 2 612 720
Email: iecs.brunei@gmail.com

Dealer/Distributor**CHINA****HOLMATRO CHINA****UNIT 14/D – 9 JOY TOWER**

9 Zhen Ning Road, Shanghai 200050, P. R. China
Contact: Floris Evers
Tel: +86 21 5238 7330 Fax: +86 21 5238 7320
Email: china@holmatro.com
Website: www.holmatro-china.com

Representative Office**HONG KONG****ABLESLINK CO LTD**

Unit B4, 2/F, Block B
Sheung Shui Plaza, 3 Ka Fu Close
Sheung Shui, N.T., Hong Kong
Contact: Mr Randy Hau
Tel: +852-2466 4568 Fax: +852-2466 4569
Email: ableslink@yahoo.com

Dealer/Distributor**INDONESIA****PT ESA KARYA MANDIRI****JL.SUNTER PARADISE**

Timur Raya, F21 No.C42, Jakarta 14350
Contact: Mr Benny N Liem
Tel: 062-21-6412936/65303502 Fax: 062-21-6412937
Email: esakarya@cbn.net.id

Dealer/Distributor**JAPAN****AKAO & CO LTD**

4-13-1 Shinmachi Nishi-ku, Osaka, Japan 550-0013
Contact: Masaya Saga
Tel: +81-6-6532-6256 Fax: +81-6-6532-3095
Email: info@akao-co.co.jp Website: www.akao-co.co.jp

Dealer/Distributor**KOREA (SOUTH)****KEO WHA HITEC CO LTD**

Rm-1F1, Jiwoo Bldg, 376-12
Seogyo-dong, Mapo-gu, Seoul, Korea
Contact: Mr Kenneth Zyung
Tel: 82-(02)-336-0145-7 Fax: 82-(02)-336-0180
Email: jfckenneth@yahoo.co.kr
Website: www.kh-hitec.com

Dealer/Distributor**MACAU SAR****TCT TRI-CONTINENTAL TRADING COMPANY LTD**

4/F-"E", Dynasty Plaza Bldg., 411-417
Ald. Dr. Carlos D'Assumpcao Macau S.A.R.
Contact: John Ferreira
Tel: +853 2875-0008 Fax: +853 2875-0007
Email: sales@tct.com.mo, john@tct.com.mo,
hanson@tct.com.mo
Website: www.tct.com.mo

Dealer/Distributor**MALAYSIA****PANDAN NIAGA SDN BHD**

No. 81A, Jalan Tabla 33/21
Shah Alam Technology Park
Seksyen 333, 40400 Shah Alam
Selangor Darul Ehsan, Malaysia
Contact: Mohd Rashdi Abd Rahman
Tel: +603 5122 1310 Fax: +603 5122 1279
Email: pnsb@pn.com.my

Dealer/Distributor**NEW ZEALAND****CHUBB FIRE & SAFETY**

3 Fisher Crescent, Mt Wellington, Auckland
Contact: Steve Kirk
Tel: +64 9 270 7441 Fax: +64 9 270 7235
Email: fireandsafety@chubb.co.nz
Website: www.chubb.co.nz

Dealer/Distributor**PHILIPPINES****WALLGREEN INDUSTRIAL VENTURES CORP**

62 West Avenue, Quezon City
Philippines 1104
Contact: Francisco C Dizon
Tel: +6 32 411 0818 Mobile: +6 32 0917 820 1947
Fax: +6 32 411 0818 Email: wivcor@yahoo.com

Dealer/Distributor**SINGAPORE****FABRISTEEL PRIVATE LIMITED**

9, Tuas Ave 10, Singapore 639133
Contact: Adros Sunan/Spencer Ong
Tel: +65 68623830 Fax: +65 68615988
Email: adros.sunan@fabristeel.com.sg

Dealer/Distributor**TAIWAN****PARKSON TRADING CO LTD**

No. 50, 3F, Hua-Ning Rd, Guo Shan Dist.
80471 Kaohsiung City, Taiwan, R.O.C.
Contact: Mr Johnson Peng
Tel: +886-7-552-1650 Fax: +886-7-552-7999
Email: ptckpeng@parkson.com.tw

Dealer/Distributor

LANCIER

AUSTRALIA**FIRE & SAFETY WA**

Unit 2/63 Furniss Road, Landsdale WA
Contact: Kerry Lovett
Tel: +61 89 3023210 Fax: +61 89 3026110
Email: firewa@fireandsafetywa.com.au
Website: www.fireandsafetywa.com.au

Dealer/Distributor**BANGLADESH****ARION OVERSEAS**

186/1 Inner Circular Road, 1000 Dhaka
Bangladesh Motijheel
Tel: +880 27101369 Fax: +880 27100043
Email: arion@bdcom.com

Dealer/Distributor**BRUNEI****HANG SAN HARDWARE**

A13 & A14 Warisan Complex/Jln. Gadong
BE3919/PO Box 1770/Bandar, Seri Begawan
BS8673
Tel: +67 324 7995 Email: hangsanbsb@yahoo.com

Dealer/Distributor**HONG KONG/CHINA/MACAU/TAIWAN****SHANGHAI TIANBEN INDUSTRIAL & CO LTD**

No.3, Lane 2500, Xiu Pu Road
Pudong District, 201315 Shanghai, China
Tel : +86 21 5042 7199
Fax: +86 21 5061 0119
Email: grainshi@163.com

Dealer/Distributor**INDIA****NEW AGE INDUSTRIES**

Ambavadi Industrial Estate, Gujarat
Tel: +91 2752 243651 Fax: +91 2224 074229
Email: neage@bom3.csnl.net.in
Website: www.newage-india.com

Dealer/Distributor**INDONESIA****P.T. SABERINDO PACIFIC**

Kompleks Ruko Cempaka Mas/
Blok J No. 10 Jl/Letjen
Suprpto/10640 Jakarta
Tel: +62 214 2888282 Fax: +62 214 2884704
Email: saberindo@saberindo.co.id

Dealer/Distributor**JAPAN****SAKURA RUBBER COMPANY LTD**

1-21-17 Sasazuka, Shibuya-ku
151-8587 Tokyo
Japan
Tel : +81-3-3466-2171
Fax: +81-3-3460-4910
Email: t-ando@sakura-rubber.co.jp

Dealer/Distributor**KOREA****HOVERTECH**

Sejin Bronzville 1415
Maesanro 1 Ga, Paldalu
442-081 Suwon
Tel: +82 312571415 Fax: +82 312571415
Email: ccllee@hovertech.com

Dealer/Distributor**MALAYSIA****WELLCROWN INTERNATIONAL RESOURCES LTD**

B-3A-5, La Grande Kiara
No. 11, Jalan Duta Kiara
Bukit Kiara
50480 Kuala Lumpur
Malaysia
Tel: 0060 3620 19966
Email: kleelee1@hotmail.com

Dealer/Distributor**NEW ZEALAND****LANCIER SOUTHWEST PACIFIC LTD**

64-66 Huia Road
Auckland
New Zealand
Tel: +64 9 276 0405 Fax: +64-9-276 6215

Representative Office**PAKISTAN****AHMAD MEDIX (PVT) LTD**

129/6 Quid-e-Azam Industrial Estate
Township, Lahore
Tel: +92 42 5213441 Fax: +92425213441
Email: info@ahmadmedix.com

Dealer/Distributor**SINGAPORE****MCALISTER & COMPANY LTD**

257 Jalan Ahmad Ibrahim SG
62914 Singapore
Tel: +65 6266 3088 Fax: +65 6265 7863

Dealer/Distributor**THAILAND****EMPIRE TECH CO LTD**

26/13-14, 26/15 Suit 101
11140 Nonthaburi
Tel: +662 595 5027 Fax: +662-595-5029

Dealer/Distributor**VIETNAM****ANH HONG TECHNOLOGY DEVELOPMENT CO**

133 Thai Ha Str., Hanoi
Tel: +84 4 3537 4250 Fax: +84-4 3537 4280
Email: anhhong-tdc@hn.vnn.vn

Dealer/Distributor

PAC FIRE AUSTRALIA (formerly Pacific Helmets Australia)

AUSTRALIA**PAC FIRE AUSTRALIA (formerly Pacific Helmets Australia)**

Unit 1, 28 Burnside Road
Hallmarc Business Park
Yatala Qld 4207, Australia
Tel: +61 7 3441 7100 Fax: +61 7 3441 7177
Email: sales@pacfire.com.au
Website: www.pacfire.com.au

Representative Office

RUSSWURM VENTILATION

CHINA**WUHAN GDW-BROCOO**

No. B-705 of Triumphal Arch Plaz
CN-430066 Plaza Xudong Road Wuhan
Contact: Tong Guo
Tel: +86 27 86835595 Fax: +86 27 86728946
Email: info@gdw-brocco.com
Website: www.gdw-brocco.com

Dealer/Distributor

INDIA**GAS ENGG. P LTD**

C408, Shiv Sagar, Plot No 79
Gorai II, Borivali West, IND-400 091 Mumbai
Tel: 0091 9820035452 Email: gec@vsnl.net

Dealer/Distributor**NARAYANI AGENCIES**

Room No. 18; Fifth Floor 506
116 . Park Lane S.D. Road, IN- 500003 Secunderabad
Contact: Kumar M S
Tel: 00919701601395 Email: sunita_na2001@yahoo.com

Dealer/Distributor**SECURITON****ASIA PACIFIC****SECURITON (M) SDN BHD**

No. 19A, Lorong Rahim Kajai 13
Taman Tun Dr. Ismail, MY-60000 Kuala Lumpur, Malaysia
Contact: Mr Lewis Chong
Tel: +60 3 7725 1699 Fax: +60 3 7725 1677
Email: asia@securiton.com.my
Website: www.securiton.com

Representative Office**AUSTRALIA****AUSTRALIAN FIRE ENTERPRISES (AFE)**

PO Box 7027, Mananning Park, NSW 2259, Australia
Contact: Mr Mike Donegan/Mr Brett Gordan
Tel: 61 2 43 592 244 Fax: 61 2 43 593 301
Email: sales@austfire.com.au/afe@ozemail.com.au

Dealer/Distributor**NATIONAL SECURITY & SURVEILLANCE**

38 Lambert Street Richmond, Victoria 3121, Australia
Contact: Mr Dominic Paruit
Tel: +61 3 9428 8055 Fax: +61 3 9428 8065
Email: dominic.paruit@natss.com.au
Website: www.natss.com.au

Dealer/Distributor**CHINA, BEIJING****SECURITONG FIRE TECHNOLOGY LIMITED COMPANY**

Room 2101, Block 1, No. 58, East 3rd Ring South Road,
Chaoyang Area, Beijing, China
Contact: Mr Gong Xinjun
Tel: +86 10 5867 2076 Fax: +86 10 5867 3319
Email: gxjbj@163.com

Dealer/Distributor**SWISS SECURITAS FIRE AND SECURITY SYSTEMS TECHNOLOGY (BEIJING) CO LTD**

Room 1808-11, 18th Floor Shouchuang Mansion
No.6 North Street, Chaoyangmen
Dongcheng Area, Beijing 100027, P.R.China
Contact: Mr Lewis Chong/Mr Todd Zeng
Tel: +86 10 6406 0558 Fax: +86 10 6406 6934
Email: todd.zeng@securiton.cn
Website: www.securiton.cn

Dealer/Distributor**BEIJING Z-N MECHANICAL & ELECTRICAL EQUIPMENT CO LTD**

1 #B910,Lingdi Office, No.13 Beiyuan Lu
Chaoyang District Beijing, China 100012
Contact: Ms Sarah Zhang
Tel: 86 10 5207 3836 Fax: 86 10 5207 3839
Email: sarahzh@vip.sina.com/ bjzhongna@yahoo.com.cn

Dealer/Distributor**CHINA, SHANGHAI****BARTEC ELECTRIC (SHANGHAI) CO LTD**

New Building 7, No. 188, Xinjun Ring Road, Shanghai
Caohejing Pujiang Hi-Tech Park (Pudong Area) Minhang
District 201114 Shanghai P.R. China
Contact: Mr Banson Tang
Tel: +86 21 3463 7288 ext: 251 Fax: +86 21 3463 7282
Email: fanmin@bartec.com.cn
Website: www.bartec.com.cn

Dealer/Distributor**DEF CHINA**

2nd Floor Building 135.
No.1421 East Zhuanxing Road, Minhang Area
Shanghai 201108
Contact: Mr Francois Yang
Tel: +86 21 3350 7133- +86 21 3350 8012
Fax: +86 21 3350 7285
Email: farech@sh163.net Website: www.def-online.com

Dealer/Distributor**SWISS SECURITAS (BEIJING) CO LTD SHANGHAI COMPANY**

Room A, 23rd Floor Shimei Mansion
No. 445 Jiangning Road, Jing'an Area
Shanghai 200041, P.R.China
Contact: Mr Lewis Chong/Mr Todd Zeng
Tel: +86 21 5228 8111 Fax: +86 21 5228 8325
Email: todd.zeng@securiton.cn

Dealer/Distributor**SHANGHAI ZHENYE INDUSTRY CO LTD**

No, 3 221, Cao Bao L, Shanghai, 200233
Contact: Mr Jack Shen
Tel: 86 21 6451 2922/2933 Fax: 86 21 6451 9955
Email: sy1199@163.com Website: www.shzhenye.com

Dealer/Distributor**CHINA, SHENZHEN****FANWO GROUP**

18F, China Economic and Trade Building
Zizhuquidao,Futian District, Shenzhen,China 518040
Contact: Dr Yao
Tel: 86 755 83222 076 / 86 755 83222 872
Fax: 86 755 83222 311
Email: yaohaowei@gmail.com
Website: www.china-hrd.com

Dealer/Distributor**SHENZHEN YAOHUAJI CHINA CO LTD**

RM.F, 20th Floor Yong – Hui Building
Guo-Qi Building, Shenzhen
Contact: Mr Raymond Ng/Ms Shi
Tel: +86 755 8212 9831 Fax: +86 755 8212 9909
Email: rng@ywk.com.hk Website: www.ywk.com.hk

Dealer/Distributor**HONG KONG****YIU WAH (KOGARAH) CO LTD**

Room 901, 9th Floor, No 113 Argyle Street
Mongkok, Kowloon, Hong Kong
Contact: Mr Raymond Ng
Tel: +852 2781 1384 Fax: +852 2782 6652
Email: ywk@ywk.com.hk Website: www.ywk.com.hk

Dealer/Distributor**INDIA, MUMBAI****BAJAJ ELECTRICALS LTD**

15/17, Sant Savta Marg, Reay Road, Mumbai – 400010
Contact: Mr Ravichandran Sr. (General Manager)
Tel: +91 22 2372 4192 Fax: +91 22 2373 0504
Email: bms@bajajelectricals.com
Website: www.bajajelectricals.com

Dealer/Distributor**VIMAL FIRE CONTROLS PVT LTD**

19/20 Vardhaman Service
Industrial Estate, L.B.S. Marg.
IN-400083 Vikhroli (West) Mumbai, India
Contact: Mr Vijay Doshi/Mr Nalin Doshi
Tel: +91 22 2578 3335 Fax: +91 22 2578 3338
Email: nalin@vimalfire.com/falgun@vimalfire.com
Website: www.vimalfire.com

Dealer/Distributor**HSE ENGINEERS PVT LTD**

2, Durgas Niwas, 1st Floor, Bhawani Tower Compound
Behind Bhawani Petrol Pump
IIT Powai, Mumbai 400076, India
Contact: Mrs Sapna Prajapati
Tel: +91 22 2578 7014 / 7015 Fax: +91 22 2578 7016
Email: hsemumbai@hseengineers.com
Website: www.hseengineers.com

Dealer/Distributor**KOREA (SOUTH)****ROYAL INDUSTRIAL TECHNOLOGY CORPORATION**

Royal Building, 3rd Floor
840-5 Yeoksam-Dong
Kangnam-Ku, Seoul 135080, Korea
Contact: Mr E S Kim/Mr J K Chung
Tel: +82 22 009 1800 Fax: +82 2 567 8831
Email: kes@ritco.co.kr/jkchung@ritco.co.kr
Website: www.ritco.co.kr

Dealer/Distributor**MALAYSIA****FITTERS DIVERSIFIED BERHAD**

No, 1 Jalan Tembaga SD5/2, Sri Damansara
52200 Kuala Lumpur
Contact: Dato' Richard Wong/Mr K K Fong
Tel: +60 3 6276 7155
Fax: +60 3 6175 2780
Email: kkfong@fittersgroup.com
Website: www.fittersgroup.com

Dealer/Distributor**SYARIKAT LETRIK CHEN GUAN SDN BHD**

Lot 1178 Jalan Subang 3, Taman Industri Sg.
Penaga, 47610 Subang Jaya, Selangor, Malaysia
Contact: Mr Choong Yew Lim
Tel: +603 5634 1436 Fax: +603 5634 2349
Email: chenguan@streamyx.com

Dealer/Distributor**PAKISTAN****EVERGREEN DEVELOPMENT CORPORATION**

Suite # 514, 5th Floor, Clifton Centre
Block 5 Kehkashan, Clifton, Karachi 75600, Pakistan
Contact: Mr Munawar Afridi
Tel: +92 21 5873 448 Fax: +92 21 5870 080
Email: genco@cyber.net.pk Website: www.edcpl.com

Dealer/Distributor**SINGAPORE****ACCLAIM SYSTEMS PTE LTD**

Blk 21 Kallang Ave # 04-165, Singapore 339412
Contact: Mr Michael Mok
Tel: +65 6299 0798 Fax: +65 6299 3735
Email: michael.mok@aspl.com.sg
Website: www.acclaim.sg

Dealer/Distributor**SWISS SECURITAS ASIA PTE LTD**

56 Serangoon North Ave 4, #06-03, Singapore 555851
Contact: Mr Andy Gan/Mr Michael Boon
Tel: +65 6853 8066 Fax: +65 6853 5939
Email: mike.boon@securitas.sg
Website: www.securitas.sg

Dealer/Distributor**TAIWAN****ATLAS TECHNOLOGY CORPORATION**

22F, No 1 Bausheng Road, Yunghe City
Taipei, Taiwan 234, R.O.C.
Contact: Mr David Liu
Tel: +886 2 223 20 556 Fax: +886 2 223 16 657
Email: david@atlasgroup.com.tw/
hunter@atlasgroup.com.tw
Website: www.atlasgroup.com.tw

Dealer/Distributor**KGIC TECHNOLOGY CO LTD**

No 36, Yingming 1st Rd., Qianzhen District
Kaohsiung City 80649, Taiwan R.O.C.
Contact: Mr Franco Lee
Tel: +886 7 715 4285/+886 7 7715 829
Fax: +886 7 711 2811
Email: lic@ms9.hinet.net

Dealer/Distributor**UNIVERSAL PATHS DEVELOPMENT CORPORATION (UPDC)**

9F-1, 306, Sec. 1, NeiHu Road
Taipei 114, Taiwan R.O.C.
Contact: Mr Terry Chung/Ms Ellie Chou
Tel: +886 2 8751 6055 Fax: +886 2 8751 6053
Email: ellie@updc.com.tw Website: www.updc.com.tw

Dealer/Distributor**THAILAND****AEGIS FIRE SAFETY CO. LTD**

19/9 Pechphirum Building 3rd Floor
Thetsabansongkhro Road Ladyao
Chatujak, Bangkok 10900
Contact: Mr Quek Yong Siah
Tel: +66 2158 0338 Fax: +66 2158 0340
Email: ysquek@aegis-fs.com

Dealer/Distributor**FIRETRADE ENGINEERING CO LTD**

Contact: Mr Taksin Tantipijit
21/56 Soi Soonvijai, Rama IX Road
Bangkapi, Huaykwang, Bangkok 10320 Thailand
Contact: Mr Taksin Tantipijit
Tel: +66 2641 4707 Fax: +66 2203 0533
Email: taksin@firetrade.co.th

Dealer/Distributor**SOLBERG SCANDINAVIAN AS****AUSTRALIA****FIRE & RESCUE AUSTRALIA PTY LTD**

190 Main Rd, Blackwood, South Australia, 5051
Contact: Dale Thompson
Tel: +61 8 8370 2739
Fax: +61 8 8370 2738
Email: dale@fireandrescueaustralia.com

Dealer/Distributor**FIRE & SAFETY WA**

96 Furniss Rd, Landsdale
Western Australia, 6065
Contact: Kerry Lovett
Tel: +61 8 9302 3210
Fax: +61 8 9302 6110
Email: kerry.lovett@fireandsafetywa.com.au

Dealer/Distributor**SOLBERG ASIA PACIFIC PTY LTD**

PO Box 182, Kingswood NSW 2747, Australia
Contact: Ted Schaefer (Technical Manager)
Tel: 61 2 9673 5300 Email: ted@solbergfoams.com
Website: www.solbergfoams.com

Representative Office**MALAYSIA****RHINOSHIELD INDUSTRIES(M) SDN BHD**

H-0-5 Ground Floor Plaza Damas
No. 60 Jalan Sri Hartamas 1
Sri Hartamas
50480 Kuala Lumpur, Malaysia
Contact: C K Lim (General Manager)
Tel: +603 62033850 Fax: +603 62032245
Email: rhinoshield@pd.jaring.my

Dealer/Distributor

SINGAPORE**CMA ENGINEERING SINGAPORE PTE LTD**

1, Yishun St. 23, #04-01 YS-One, Singapore 768441
 Contact: Christopher Lee
 Tel: +65 6563 6860
 Fax: +65 6563 2366
 Email: chrislee@cma.com.sg
Dealer/Distributor

TASK FORCE TIPS INC**AUSTRALIA****GAAM EMERGENCY PRODUCTS**

29 Temple Dr., P.O. Box 211
 Thomastown, Victoria 3074, Australia
 Tel: +61 3 9466 1244 Fax: +61 3 9466 4743
 Email: iprice@tycoint.com
 Website: www.gaam.com.au
Dealer/Distributor

CHINA**SHANGHAI JINDE INDUSTRY DEVELOPMENT CO LTD**

Room 610, 1 Lane 50, Xin Cun Road
 Shanghai, 200065, China
 Tel: +86 21-360-50599 Fax: +86 21-360-55599
 Email: jmgushon@online.sh.cn
Dealer/Distributor

HONG KONG**ROTTER INTERNATIONAL LTD**

Unit A G/F., Hung To Road, 6-8 Hung To Road
 Kowloon, Hong Kong
 Tel: 85227517770 Fax: 85227562051
 Email: jacky@rotter.com.hk
Dealer/Distributor

INDIA**FOREMOST TECHNICO PVT LTD**

M-1, Green Park Extension, New Delhi 110016, India
 Tel: +91 (11) 2619 6982 Fax: +91 (11) 2616 6961
 Email: foremost@hathway.com
 Website: www.foremost-india.com
Dealer/Distributor

INDONESIA**PT PALMAS ENTRACO**

Jl. Krekot 85, Jakarta-Pusat, Indonesia
 Tel: +62 (21) 384 1681 Fax: +62 (21) 380 2660
 Email: ptpalmas@attglobal.net
Dealer/Distributor

JAPAN**YONE CORPORATION**

23, Nishinakaai-Cho, Nishinokyo
 Nakagyo-Ku, Kyoto 604, Japan
 Tel: +81 (7) 582-11185 Fax: +81 (7) 580-12263
 Email: t.yone@myad.jp
 Website: www.yone-co.co.jp
Dealer/Distributor

KOREA (SOUTH)**SHILLA FIRE CO LTD**

433-11 Non Hon-Dong, Nam Dong-Gu
 Incheon City 405-300, South Korea
 Tel: +82-02-3665 9011 Fax: +82-02-3663 9113
 Email: kofire77@hotmail.com
 Website: www.firekorea.com
Dealer/Distributor

MALAYSIA**SENTRIX TECHNOLOGY SDN BHD**

No. 2A-2, 1st Floor Jalan USJ 21/7
 UEP Subang Jaya, 47630 Subang Jaya
 Selangor Darul Ehsan, Malaysia
 Tel: +603 8023-5228 Fax: +603 8023-5618
 Email: chong@sentrrix.com.my
 Website: www.sentrrix.com
Dealer/Distributor

NEW ZEALAND**TYCO SAFETY PRODUCTS**

6 Portage Road
 New Lynn Auckland 0600, New Zealand
 Tel: +64 9 826 1707 Fax: +64 9 826 1740
 Email: sgurnick@tycoint.com
 Website: www.tycosafetyproducts.com
Dealer/Distributor

PAKISTAN**FIRESTOP PVT LIMITED**

6/B, 1st Floor, Dinar Chambers
 PO Box # 5786, West Wharf Road
 Karachi-74000, Pakistan
 Tel: 9221-2315675, 2313065
 Fax: 9221-2310457, 5831015
 Email: info@firestopaids.com
 Website: www.firestopaids.com
Dealer/Distributor

PHILIPPINES**ALLIANCE INDUSTRIAL SALES**

Unit 4, Finlandia Town Homes
 #1700 Dian, cor. Finlandia Street
 Brgy. San Isidro, 1234 Makati City
 Philippines
 Tel: +63 21 7546 1749 Fax: +63 2 887 7173
 Email: alliance8_jcy@pacific.net.ph
Dealer/Distributor

SINGAPORE**S.K. ROSENBAUER PTE LTD**

8 Tuas Drive 2
 Singapore 638643
 Singapore
 Tel: +65 6862 3155 Fax: +65 6862 0273
 Email: houchin@skrosenbauer.com
 Website: www.skrosenbauer.com
Dealer/Distributor

TAIWAN**YONE CORPORATION**

23, Nishinakaai-Cho, Nishinokyo
 Nakagyo-Ku, Kyoto 604, Japan
 Tel: +81 (7) 582-11185 Fax: +81 (7) 580-12263
 Email: t.yone@myad.jp
 Website: www.yone-co.co.jp
Dealer/Distributor

THAILAND**ANTI-FIRE, CO LTD**

316-316/1, Sukhumvit 22 Road
 Klongtoey Klongtoey
 Bangkok 10110, Thailand
 Tel: 6622596898 Fax: 6622582422
 Email: sithichai@antifire.com
 Website: www.antifire.com
Dealer/Distributor

TEMPEST TECHNOLOGY CORPORATION**AUSTRALIA****BRITAX AUTOMOTIVE EQUIPMENT**

79 Crookford Street
 Northgate, QLD 4013
 Contact: Mr Peter Ogden
 Tel: [61] 7 3000 1900 Fax: [61] 7 3000 1999
 Email: pogden@britaxae.com.au
Dealer/Distributor

BANGLADESH**HUSSAIN TRADING COMPANY LTD**

Sonartori Tower
 12 Sonargaon Road, Dhaka 1000
 Contact: Mr Waliul Islam
 Tel: [880] 29666163 Fax: [880] 29663554
 Email: waliul@rangs.com.bd
Dealer/Distributor

HONG KONG**GRAND POWER ENGINEERING LTD**

Tower A, Rm 503
 Hung Hom Commercial Centre
 37-39 Ma Tau Wai Road
 Hung Ho, Kowloon
 Contact: Mr Tommy Wu
 Tel: [852] 2365-5252 Fax: [852] 2764-0237
 Email: tommywu@howswing.com
Dealer/Distributor

INDIA**JYOTECH ENGINEERING & MARKETING CONSULTANTS**

H-49A, Kalkaji, New Delhi 110 019
 Contact: Mr Chandan Bhatia
 Tel: [91] 11 26447966 Fax: [91] 11 26482189
 Email: chandan.bhatia@jyotech.com
Dealer/Distributor

INDONESIA**PT ASTANITA SUKSES APINDO**

JL Balet A/6, Kelapa Gading
 Jakarta Utara 14240
 Contact: Mr Endy
 Tel: [62] 21 4584 1590 Fax: [62] 21 4584 1591
 Email: endy_asa@yahoo.com
Dealer/Distributor

JAPAN**SAKURA RUBBER CO LTD**

1-21-17, Sasazuka
 Shibuya-Ku, Tokyo 151-8587
 Contact: Tatsuya Ando
 Tel: [81] 3 3466 2171 Fax: [81] 3 3460 4910
 Email: t-ando@sakura-rubber.co.jp
Dealer/Distributor

MALAYSIA**CITO MARKETING (M) SDN BDH**

No. 11, Jalan SS15/4B
 47500 Subang Jaya, Selangor Darul Ehsan
 Contact: Mr Abu Raihan Wan Jaafar
 Tel: [60] 56311286 Fax: [60] 56340583
 Email: aburaihan@citogroup.com.my
Dealer/Distributor

PHILIPPINES**INPOLCHEM TRADING**

29 Antoinette St.
 Parkway Village, Quezon City 1106
 Contact: Mr Karlo Aquino
 Tel: [63] 2 361-7189 Fax: [63] 2-362-9002
 Email: karlo.aquino@gmail.com
Dealer/Distributor

SAUDI ARABIA**DESERT DIAMOND EST. FOR TRADING**

286 Prince Abdul Aziz Ibn
 Musaed Bin Jalawi Road, Olaya
 PO Box 29869, Riyadh 11467
 Contact: Mr A. F. Ghali
 Tel: [966] 1 279 1588 Fax: [966] 1 293 1254
 Email: desertdi@anet.net.sa
Dealer/Distributor

TAIWAN**CHANG'S WORLD ENTERPRISE CO LTD**

1F, No. 19, Lane 22, Dun Hua N. Rd, Taipei 10546
 Contact: Ms Marisa Chang
 Tel: 886-227-153658 Fax: 886-227-153659
 Email: chwworld@ms22.hinet.net
Dealer/Distributor

THAILAND**FIRE & RESCUE INTERNATIONAL CO LTD**

51/193 M., 1 Thanam-Non Road
 A. Muang., Nonthaburi 11000
 Contact: Mr Dirk Bloxham
 Tel: [66] 2 886-7556 Fax: [66] 2 886-7585
 Email: exec@pacificandfire.com
Dealer/Distributor

TYCO FIRE SUPPRESSION & BUILDING PRODUCTS**SINGAPORE****TYCO FIRE SUPPRESSION & BUILDING PRODUCTS**

2 Serangoon North Avenue 5
 #07-01 Fu Yu Building
 Singapore 554911, Singapore
 Tel: (+65) 6577 4360 Fax: (+65) 6481 8791
 Email: sales-ap@tycofp.com
Representative Office

ANSUL

2 Serangoon North Avenue 5
 #07-01 Fu Yu Building, Singapore 554911
 Singapore
 Tel: (+65) 6577 4360 Fax: (+65) 6481 8791
 Email: sales-ap@tycofp.com Website: www.ansul.com
Representative Office

HYGOOD

2 Serangoon North Avenue 5
 #07-01 Fu Yu Building
 Singapore 554911
 Singapore
 Tel: (+65) 6577 4360 Fax: (+65) 6481 8791
 Email: sales-ap@tycofp.com Website: www.hygood.co.uk
Representative Office

PYRO-CHEM

2 Serangoon North Avenue 5
 #07-01 Fu Yu Building
 Singapore 554911
 Singapore
 Tel: (+65) 6577 4360 Fax: (+65) 6481 8791
 Email: sales-ap@tycofp.com Website: www.pyrochem.com
Representative Office

SKUM

2 Serangoon North Avenue 5
 #07-01 Fu Yu Building, Singapore 554911
 Singapore
 Tel: (+65) 6577 4360 Fax: (+65) 6481 8791
 Email: sales-ap@tycofp.com Website: www.skum.com
Representative Office

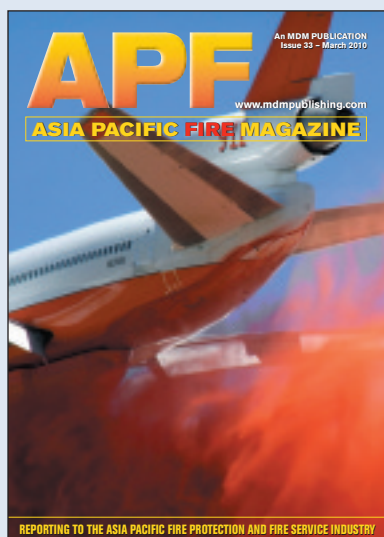
SABO FOAM

2 Serangoon North Avenue 5
 #07-01 Fu Yu Building, Singapore 554911
 Singapore
 Tel: (+65) 6577 4360 Fax: (+65) 6481 8791
 Email: sales-ap@tycofp.com
 Website: www.sabofoam.com
Representative Office

SUBSCRIPTIONS

ASIA PACIFIC FIRE MAGAZINE

GET YOUR SUBSCRIPTION NOW!!!



**APF IS PUBLISHED 4 TIMES A YEAR
– MARCH, JUNE, SEPTEMBER
AND DECEMBER**

Name: _____

Company/Organisation: _____

Address: _____

Telephone: _____

Fax: _____

E-mail: _____

Start Subscription from Issue: _____

Subscription Rates: Sterling £50.00 AUS Dollars – \$100.00
US Dollars – \$70.00

Back Issues: US \$18.00, £10.00 or AUS Dollars \$20
each inclusive of P&P (subject to availability)

METHODS OF PAYMENT:

Website Subscription: www.mdmpublishing.com

Cheque: _____ MDM Publishing Ltd.

Visa/Mastercard No: _____

Expiry Date: _____ Security Code: _____
(last three digits on reverse of card)

If paying by credit card please fax details. DO NOT post/mail.
Fax: +44 (0) 1935 426926

MDM Publishing Ltd.

The Abbey Manor Business Centre, The Abbey, Preston Road,
Yeovil, Somerset BA20 2EN, United Kingdom

ADVERTISERS' INDEX

Alert Ziegler GmbH & Co. KG	59
Bauer Compressors Asia Pte Ltd	19
Black Diamond Group Inc	34
Bio-Ex	17
Bristol Uniforms Ltd.	55
Coltri Asia Pacific	64
Chemguard, Inc.	63
Control Logic s.r.l.	39
Cutters Edge	15
Dafo Brand AB	26
Dafo Fomtec AB	60
Draeger Safety Asia Pte Ltd.	OBC
Dr. Sthamer Hamburg	65
Dynax Corporation	40
e2v Technologies	45
Fike Corporation	46
Firec 2010	06
Fire Fighting Enterprises	54
Firetrace International	13
GB Solo Ltd.	19
Gielle s.r.l.	52
Holmatro Rescue Equipment	23
Janus Fire Systems	49
Lancier Hydraulik Co. KG	45
NFPA	02
PAC Fire Australia	20
PBI Performance Products, Inc.	IBC
Plastika Akrapovic	51
Rosenbauer International AG	56
Russwurm Ventilatoren GmbH	26
Securiton AG	37
Solberg Asia Pacific Pty. Ltd.	43
Safety Technology International (Europe) Ltd.	17
Super Vacuum Manufacturing Inc.	31
Task Force Tips, Inc.	IFC
Tempest Technology Corporation	29
Texas A & M Emergency Services Training Institute	49
Tyco Fire Suppression & Building Products – Asia Pacific – Ansul	08
Unifire, Inc.	33

PBI Matrix®... The Power Grid.



Better performance, better comfort and better value in outer shell protection. PBI Matrix® takes PBI's proven protective characteristics of unmatched flame and thermal protection to another level by reinforcing them with a unique grid of high strength aramid filament fiber — for unsurpassed performance and durability. Tough and rugged, PBI Matrix responds call after call and remains service worthy by providing increased resistance to rips, tears and abrasions. This revolutionary outer shell is lightweight, fast drying, and offers superior comfort and reliability. More than just premium protection, it's a valuable asset in your fire fighting arsenal. PBI Matrix...the switch is on.



PBI Performance Products, Inc. // 9800 Southern Pine Blvd Suite D // Charlotte, NC 28273 // 704-554-3815 // walt.lehmann@pbiprducts.com

Im Gewerbepark D23 // D-93059 Regensburg, Germany // T +49 (0) 941 465 275 9-9 // F +49 (0) 941 465 275 9-8 // helmut.zepf@pbiprducts.com



www.pbiprducts.com

Developed by Professionals For the Professionals



Dräger FPS 7000
Dräger PSS 7000

A product developed for extreme conditions

The Dräger PSS 7000 is the result of Dräger's ongoing commitment to providing professional fire fighters with a world class state-of-the-art breathing apparatus.

Key new features of the PSS 7000 is the harness that uses advanced materials and moulding methods to produce exceptional wear resistance and a high grip anti-slip surface to ensure that the harness remains secure on the body.

With easier seamless integration and interface with the facemask, communication equipment, head protection and good ergonomic design to create a higher performance personal safety system, the Dräger PSS 7000 is a major leap forward in the evolution of breathing apparatus for the professional fire fighter.

APF

An MDM PUBLICATION
Issue 34 – June 2010

www.mdmpublishing.com

ASIA PACIFIC FIRE MAGAZINE



REPORTING TO THE ASIA PACIFIC FIRE PROTECTION AND FIRE SERVICE INDUSTRY

TASK FORCE TIPS, INC.



3701 Innovation Way, Valparaiso, IN 46383-9327 USA
International +1.219.548.4000 • www.tft.com • intsales@tft.com

QuadraCup

Selectable Foam Nozzle

110, 230, 360 & 470 l/min
38 mm Coupling



The TFT QuadraCup is a rugged and dependable selectable gallonage nozzle with a retractable foam aspiration sleeve. When the outer sleeve is in the retracted position, the nozzle operates the same as the TFT QuadraFog. Flow can be set to any one of four settings, or to a flush mode. The front end can be rotated from straight stream through wide fog patterns. Uniquely cut fixed metal fog teeth produce a wide range of fog patterns.

Available in either tip-only configuration or with a stainless ball shutoff, the QuadraCup is also available with optional colored pistol grip and handle covers (NFPA 1901 (A.16.9.1)).

QuadraFog Selectable Liter Nozzle



Top Quality Material

With one heavy duty Stainless Steel ball valve to shutoff the nozzle you get a 100% reliable and low maintenance unit.

**NFPA 1964
Compliant**



QuadraFog Nozzle

**Fixed or
Spinning Teeth**

Stainless Steel Fog Teeth

Fog Teeth made from 316 stainless steel offer enhanced resistance to damage and increased corrosion resistance. Strong equipment designed to last a long time in harsh environments.

**110 - 2000 l/min Fixed,
Selectable or Automatic**

For excellent quality fire fighting equipment visit www.tft.com and call your local distributor for a demonstration. Display equipment, literature and digital data can be obtained by contacting your trained TFT distributor.



AUSTRALIA

Gaam Emergency Products-AU
Phone : 61394661244
Fax : 61394664743
iprice@tycoint.com
www.gaam.com.au



INDIA

Foremost Technico Pvt Ltd
Phone: +91 (11) 2619 6982
Fax: +91 (11) 2616 6961
foremost@hathway.com
www.foremost-india.com



MALAYSIA

Sentrix Technology Sdn Bhd
Phone: +603 8023-5228
Fax: +603 8023-5618
chong@sentrix.com.my
www.sentrix.com.my



SINGAPORE

S.K. Fire Pte. Ltd.
Phone: 6568623155
Fax : 6568620273
houchin@skfire.com
www.skfire.com



CHINA

Shanghai Jin De Industry
Phone: 862136050599
Fax: 862136055599
sjinde@163.com
www.sjinde.com



INDONESIA

Pt Palmas Entraco
Phone: +62 (21) 384 1681
Fax: +62 (21) 380 2660
sales@palmas.co.id



NEW ZEALAND

Tyco Safety Products
Phone: 6445608127
Fax: 6498270844
tsp.sales.nz@tycoint.com
www.tycoservices.co.nz



SOUTH KOREA

Shilla Fire Co., Ltd.
Phone: 820236659011
Fax: 820236639113
kofire77@hotmail.com
www.firekorea.com



HONG KONG

Rotter International Ltd.
Phone: 85227517770
Fax: 85227562051
jacky@rotter.com.hk
www.rotterbiz.com



JAPAN / TAIWAN

Yone Corporation
Phone: 81758211185
Fax: 81758012263
t.yone@myad.jp
www.yone-co.co.jp



PHILIPPINES

Alliance Industrial Sales
Phone: 6328908818
Fax: 6328960083
alliance8_jcy@pacific.net.ph

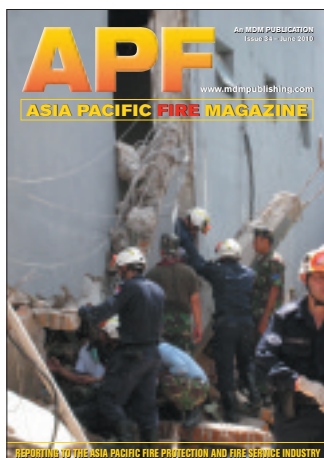


THAILAND

Anti-fire Co., Ltd.
Phone: 66 2 259-6898
Fax: 66 2 258-2422
sithichai@antifire.com
www.antifire.com

www.tft.com

**June 2010
Issue 34**



Front Cover Picture: Singapore Civil Defence search through a collapsed hotel following the 2009 Padang Earthquake. Courtesy of Saraid

Publishers
Mark Seton & David Staddon

Editorial Contributors
Ian Turner, Alfred Thornton, Rod Carringer, The S.E.A. Group, James "Andy" Lynch, Ernst Hepler, Edward E. Hartin, MS, EFO, MIFireE, CFO

APF is published quarterly by:
MDM Publishing Ltd
The Abbey Manor Business Centre,
The Abbey, Preston Road, Yeovil,
Somerset BA20 2EN, United Kingdom
Tel: +44 (0) 1935 426 428
Fax: +44 (0) 1935 426 926
Email: mark.seton@apfmag.com
Website: www.mdmpublishing.com

©All rights reserved

Subscription Rates
Sterling – £50.00
AUS Dollars – \$100.00
US Dollars – \$70.00
(Prices include Postage and Packing)
ISSN – 1476-1386

DISCLAIMER:
The views and opinions expressed in ASIA PACIFIC FIRE MAGAZINE are not necessarily those of MDM Publishing Ltd. The magazine and publishers are in no way responsible or legally liable for any errors or anomalies made within the editorial by our authors. All articles are protected by copyright and written permission must be sought from the publishers for reprinting or any form of duplication of any of the magazines content. Any queries should be addressed in writing to the publishers.

Reprints of articles are available on request. Prices on application to the Publishers.

Page design by Dorchester
Typesetting Group Ltd
Printed in Singapore

Contents

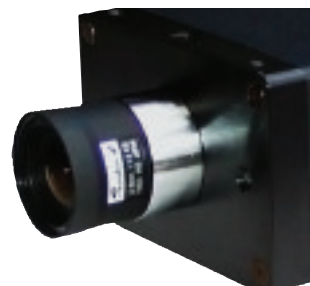


17-23

05 NFPA Foreword

06-14 News & Product Profiles

17-23 The International Search & Rescue Response to the 2009 Padang Earthquake



39-42



25-26

25-26 Fire Suppression

29-32 Large Fires Require Large Water and Foam Flows



45-50

35-37 The Ins and Outs of Breathing



29-32

39-42 The Advance of Video Image Detection

45-50 Structural Fire Fighting Helmets Roundup



53-57

53-57 Prepared for the Unavoidable?



35-37

59-63 Live Fire Training as Simulation

64-71 Distributor & Representative Office Listing



59-63

72 Advertisers' Index

Collins to join MDM Publishing Ltd as Group Editor



Well known industry figure Graham Collins will join MDM Publishing Ltd as Group Editor, starting in June 2010. He will take direct responsibility for all editorial matters involving MDM's three leading trade magazines, International Fire Protection, International Fire Fighter and Asia Pacific Fire. When asked to comment on the appointment Collins said "I am thrilled to be joining such an exciting and dynamic organisation as the Group Editor. MDM Publishing Ltd has established its titles as the leading business to business international journals available to fire professionals around the world. I am looking forward to shaping new editorial features and exciting new content in the coming months within all three journals".

Graham has worked and lived in the USA, Middle East, France, Germany and Japan and brings over 15 years experience in the international fire industry, particularly fire suppression, foam concentrates and hardware, detection and alarm systems and emergency response. He has been a regular contributor in fire safety and construction industry magazines including the MDM Publishing Ltd titles. He has also worked as a specialist campaigns director for a fire industry PR company for the past 20 years. Graham is married and lists photography as one of his major interests.



MDM Pu
WORLDWIDE

www.mdmpu

Hi-Tech P

FEATU

VIRTUAL ELECTRONIC MAGAZINES

BANNER ADVERTISEMENTS

FULL PDF FILE DOWNLOADS

LIVE LINKS

SIMPL
COMPA

MDM Publishing Ltd, The Abbey Manor Business Centre,

Tel: +44 (0) 1935 426 428

www.mdmpublishing.com

blishing Ltd
MEDIA

blishing.com **ortal Site** **RING**

FULL VIRTUAL ARCHIVE OF BACK ISSUES

LIVE REAL PAGE TURNING SOFTWARE

EVENTS PAGE

AND MUCH, MUCH MORE ...

Y NO **RISON**



The Abbey, Preston Road, Yeovil, Somerset BA20 2EN, UK

Fax: +44 (0) 1935 426 926

www.mdmpublishing.com

MEMBERSHIP



Up-To-Date? It's Up to You!

NFPA® membership is indispensable for more than 81,000 professionals worldwide. What about you? It's an easy decision for anyone involved with protecting people and property, because NFPA keeps members on top of breakthroughs, research, and technology...and in control of their careers. **Join now and SAVE 10%** on NFPA codes, products, and seminars, while **you stay up-to-date** with:

- **NFPA Journal®**, the award-winning bimonthly membership magazine loaded with articles, codes and standards information, investigations, case studies, and reports
- Answers to your code questions from NFPA's experienced fire protection specialists
- Online issues of **NFPA News** for codes and standards activities, and **NFPA Update** for training opportunities and events
- FREE membership in any of 16 industry-specific sections including Fire Service; Building Fire Safety Systems; Health Care; Electrical; and Architects, Engineers, and Building Officials
- The latest **NFPA Journal Buyers' Guide**—your bonus gift valued at \$40

Gain a decided advantage on the job. Join NFPA today!

Become part of the world's largest organization for fire, electrical, and building safety professionals and stay up-to-date for only \$150 annual dues—satisfaction guaranteed.

**To join call 1-617-770-3000, or visit
nfpacatalog.org.**



By James M. Shannon

NFPA President & CEO

Foreword

When Process Meets Commitment

When I first came to work at NFPA more than 19 years ago, I arrived with no experience in standards development and, candidly, only a rudimentary understanding that government and industry relied on a private system to determine appropriate minimum safety requirements. In those early days of my NFPA career, I set out to learn as much as I could as quickly as I could, because as NFPA General Counsel I was expected to provide legal advice to our Standards Council and staff.

I started my education in standards development by asking questions of our staff. All of the staff, especially Art Cote, who was then our chief engineer, were generous with their time and patient with me as I began to learn about the NFPA standards development system. When I learned that we had about 300 documents that incorporated the work of 7,000 technical committee members, I wondered why so many people would volunteer so much valuable time and how the work of those volunteers could ever be efficiently channeled in our system. When I learned that the process was open to anyone, around the world who wanted to participate and that our system had multiple opportunities for interested parties to make their case for amendments to our documents, I have to admit that I was more than a little skeptical that we could process so many documents of substance and complexity on the regular revision schedules.

As the months passed and I worked with our staff, attended my first technical committee and Standards Council meetings, and sat through my first technical session at our Annual Meeting, I began to understand the unique role played by NFPA and other organizations that develop safety standards in a consensus process. People, who rely on our standards and codes, including countries that adopt them into law, can be confident that the rules under which they are developed are fair and open, that decisions are based on technical merits, and that no interest can dominate the process to serve its own purposes. We work hard to attract the best people to our process and to make sure that our rules are followed, because everything we do depends upon our reputation as an honest, unbiased steward of the process.

But I also concluded that having a strong and well-managed process, with all the necessary protections scrupulously enforced, is just part of the answer to the question of why NFPA has been such a force in fire and electrical safety for so long. The other part is the enthusiasm and commitment of those who participate in our process. When you have seen a few cycles of the *National Electrical Code®* or the *Life Safety Code®*, or if you have had the chance to spend some time with technical committee members who work on the sprinkler codes or the *National Fire Alarm Code®*, you must have been struck, as I have been over and over again, by the enthusiasm and commitment of the people who participate in our process.

For them, involvement with NFPA is not a job: it is a cause. They might have gotten into the process for professional reasons, but for the overwhelming majority of our participants, the process and the way it enhances safety for millions of people worldwide have become important reasons for their continued participation. The enthusiasm that I saw in the staff when I first came to NFPA, and that I still see every day, is the same enthusiasm I see whenever I speak with our volunteers.

I believe that the United States standards development process, in bringing together so many diverse interests and so much technical expertise in the effort to reach consensus, is the best standards system in the world, and I am proud to say that there is no better example of that system at its best than NFPA's. There are already many opportunities for international constituents to participate in the process and as the use of the internet continues to grow and technology improves it is becoming even easier for people in different locations to become involved.

APF

Electrical Building Technology Guangzhou, 9-12 June 2010

China Import and Export Fair, Pazhou Complex, Guangzhou, China

More than 100 leading industry players will showcase their building technology products

KNX China, providers of an international home and building electronic standard sign up for show

Fringe programme events expected to attract record attendance

More than 100 exhibitors from Asia, Europe and the USA will showcase their building technology products at ELECTRICAL BUILDING TECHNOLOGY GUANGZHOU to be held 9-12 June 2010 at the China Import and Export Fair Pazhou Complex, Guangzhou, China.

Due to increased exhibitor numbers for the 2010 show, the exhibition floor space has increased by 25 per cent to 5,000 sqm. Exhibitors will include leading industry players such as (listing by country and region): Dynalite (Australia), Beckhoff Automation (Germany), Graesslin (Germany), HKC Technology (Hong Kong), Passion Living (Hong Kong), Renewable Energy Group (Hong Kong), Simon Electric (Spain), DAE Instrument Corp (Taiwan) and Echelon Corp (USA).

KNX China, providers of an international home and building electronic standard sign up for show

Also taking part in Electrical Building Technology Guangzhou is first time exhibitor KNX China which develops and promotes a worldwide standard for home and building control. This standard is based on more than 20 years experience and is approved as the Chinese standard GB/Z 20965 as well as an international standard (ISO/IEC 14543-3). The KNX China 150 sqm booth will include an on-site presentation area and a networking area for business discussions.

KNX China's board directors all come from worldwide leading brands of intelligent building companies that include ABB, Hager, Schneider Electric and Siemens.

"We are very happy and honoured to welcome KNX China to the show," said Mr Jason Cao, General Manager of Messe Frankfurt in China. "As Asia's most important forum for intelligent building services technologies and a comprehensive sourcing hub for architectural technologies, Electrical Building Technology Guangzhou is an ideal industry platform for KNX. It is a very important organisation as China is still reliant on foreign expertise for the latest building technology and the KNX standard is helping to develop the country's building automation market by offering convenience, more safety and higher energy savings."

Fringe programme events expected to attract record attendance

Electrical Building Technology Guangzhou will continue its popular fringe programme with two important events – the Electrical Building Technology Symposium 2010 and the KNX Seminar.

The Electrical Building Technology Symposium will be presented on 10 June in co-operation with the Intelligent Building Committee of China Construction Industry Association, a division of China Construction

Industry Association. This year's theme is Energy Saving and Intelligent Building technologies.

The KNX Seminar will be held on June 10, during which time the association will share the latest news about its standard and technical application for green buildings, hotels and residential properties.

Electrical Building Technology Guangzhou is part of the architecture and technology fairs of Messe Frankfurt, headed by the biennial Light+Building event in Frankfurt. The Guangzhou show is organised by Guangzhou Guangya Messe Frankfurt and runs concurrently with the Guangzhou International Lighting Exhibition.

For more information, please visit www.building.messefrankfurt.com.cn or contact the organiser, Guangzhou Guangya Messe Frankfurt at LBguangzhou@hongkong.messefrankfurt.com

Det-Tronics® GT3000 Toxic Gas Detector Family Receives ATEX Approval

DETECTOR ELECTRONICS CORPORATION (Det-Tronics) GT3000 Toxic Gas Detectors have received ATEX hazardous location and performance certification. In addition, GT3000 Toxic Gas Detectors are FM, CSA, CE, and IECEx certified and have earned the IP66 rating. Det-Tronics is part of UTC Fire & Security, a unit of United Technologies Corp. (NYSE:UTX). The GT3000 family is a group of electrochemical fixed-point detectors that provide non-intrusive calibration, communication via 4-20mA with HART protocol, and the ability to swap sensors without de-classifying hazardous areas.

A GT3000 detector consists of a transmitter (GTX) and a sensor module (GTS). The transmitter generates a 4-20mA output signal with HART that is



The Det-Tronics GT3000 toxic gas detector (shown with FlexVu® Universal Display) is an electrochemical fixed-point sensor and transmitter providing HART communication, non-intrusive calibration, and hot-swap sensors

proportional to the concentration of the target gas and corresponds directly to 0-100% full scale.

Currently, the GT3000 family includes sensors that detect these gases: hydrogen sulfide (H₂S), oxygen (O₂), carbon monoxide (CO), ammonia (NH₃), chlorine (Cl₂), and sulfur dioxide (SO₂). More gases will be added soon.

"Although GT3000 is approved as a stand-alone device," says product development manager Mike Bragg, "many users choose to partner it with our FlexVu® Universal Display for quick device set up and easy access to sensor status."

For more information please contact:

Detector Electronics Corporation (Det-Tronics)
Tel: +1 952 941 5665
Website: www.det-tronics.com

Dräger Chemical Protective Suits – CPS 5900 & CPS 7900

As an alternative to the known reusable protective suits, Dräger has developed the new CPS 5900. The limited use suit easily meets and exceeds European and International standards of protection.



Dräger CPS 5900



Dräger CPS 7900

Light and gastight: Dräger CPS 5900

Choosing the correct protective clothing is key when working with dangerous substances or hazardous goods. The new CPS 5900 Dräger offers a lightweight, gastight protective suit that protects against many industrial chemicals. The single exposure protective suit was developed for low-risk situations such as control measurements or the transfer of toxic substances without risk of explosion. With its protective function, the new limited use suit meets the International requirements of firefighting, rescue services and industries. The CPS 5900 is the world's first chemical protective suit approved by EN 943 Part 1 & 2 (ET) and the SOLAS Convention.

Maximum protection with high comfort

The comfort of the protective suit affects the physical and psychological capacity of the user. The CPS 5900 provides high freedom of movement through its flexible material and has a hip strap for size adjustment. All personal protective gear is worn inside the one-piece suit. Through the flexible two-layer visor, the wearer has a nearly natural field of vision.

The zipper of the CPS 5900 is protected from external influences by a double flap with continuous Velcro and allows for easy dressing and undressing. The integrated gastight socks with splash guard also ensure safety.

Dräger supplies the gastight CPS 5900 suit with a dual glove system, consisting of inner gloves with a laminated barrier against chemicals and elastic outer gloves made from butyl. The gloves are secured with a locking cuff on the suit so the wearer can exchange the gloves if necessary.

The Dräger CPS 5900 is available in five different sizes: 1.50 m to 2.10 m height (4'9" to 6'8") (S, M, L, XL, XXL).

The CPS 5900 is manufactured by Dräger Safety AG & Co. KGaA.

Second skin for tough assignments: Dräger CPS 7900

Dräger has developed and produced chemical protection suits for over 50 years. These years of experience are evidenced by the new gas-tight Dräger CPS 7900, which also easily meets international standards. The reusable suit is resistant to flames, chemicals, warfare agents, and liquefied gasses. In addition, it displays high mechanical resistance and can be used in potentially explosive atmospheres.

Five material layers protect against external influences

Chemical protective suits (CPS) are essential for working with hazardous chemicals. For assignments under these extreme conditions, the new gas-tight Dräger CPS 7900 offers higher protection. Its new suit material, D-mex, enables a special resistance to

a wide variety of toxic substances and offers comprehensive protection from chemical effects, liquefied gasses, and bursts of flames.

D-mex protects during work in potentially explosive atmospheres as well as with the handling of frozen substances and hazardous substances at temperatures down to -80°C. The suit even retains its protective effect if the surface is damaged. The material combination of a sturdy elastomer layer, chemically resistant laminate layer, and tearproof textile ensures this.

Exceeds international standards

Numerous international and national standards, for example the European EN 943-2 and the SOLAS-convention specify the safety standards for chemical protection suits. Due to its new textile material, Dräger CPS 7900 not only meets all the specified standards for reusable protection suits, but also exceeds the requirements for emergency teams from firefighters, rescue services, and industry.

Ergonomic details and accessories make daily operations easier

The working conditions for CPS wearers are extremely demanding. The CPS 7900 reduces these stresses through its wearing comfort and ergonomic functional details. The light and flexible suit material in blue or orange conforms to the wearer's movements. The suit design allows high freedom of movement. In addition, there are five suit sizes available for emergency teams from 1.5 m to 2.10 m. In addition, with the aid of length adjustments, the wearer can adjust the pace length individually. The anti-fog disk prevents fogging of the visor and ensures an almost natural field of view.

Three options of glove combinations, which can be fastened quickly and without tools to the suit, enable the retention of fine motor skills as much as possible. Exchangeable boot connections and functional safety boots offer the wearer secure footing.

The optional accessories expand the possibilities for application of the new Dräger CPS 7900. A manometer holder on the edge of the visor helps the wearer to keep the air pressure in sight without having to remove his arm from the sleeve. The D-Connect is used for attaching measuring instruments or tools both on the left and right hip and can be used for crash rescue by injured persons as well. Moreover, if the air supply of the compressed air breathing apparatus is not sufficient for the entire mission, the Air-Connect and the PT 120 L control valve on the front of the suit offers a connection to an external breathing air source. The control valve also makes it possible to cool the suit and thus increases the wearing comfort.

The CPS 7900 is manufactured by Dräger Safety AG & Co. KGaA.

APF

For more information, please visit www.draeger.com

**F****FUEL STORAGE/HANDLING****O****OFFSHORE/MARINE****A****AVIATION****M****MANUFACTURING**

JUST A FEW OF THE PLACES ANSUL® FOAM MAKES PERFECT SENSE.

For that matter, advanced ANSUL Firefighting Foams protect flammable liquids wherever they are manufactured, stored, dispensed, processed or transported. Every ANSUL foam — AFFF, AR-AFFF, High-Expansion, fluoroprotein and protein — is the result of extensive research, development and testing at the ANSUL Fire Technology Center. Our concentrates are tested to international standards and specifications. And ANSUL foam is delivered through a wide range of portable and fixed foam systems, generators, proportioning equipment and discharge devices.

ANSUL Firefighting Foams. No matter how you spell it, it comes out **P-R-O-T-E-C-T-I-O-N**.



www.ansulinfo.com/apfoam

by Tyco Fire Suppression & Building Products

ANSUL Foam Systems Safeguard Jet Fuel Tank Farm

Fire hazards are particularly evident in the aviation industry, where they constantly handle flammable fuel storage tanks. Given the extensive costs of hangers and modern aircrafts, a fire would result in substantial asset and property loss. Such severe damages can result in unimaginable devastation to employees and travelers alike. With such significant risks, the fuel storage facility cannot afford a system, which is anything less than the best.

The Jet Fuel Tank Farm at Washington Dulles International Airport in Washington DC handles, stores and transports large volumes of flammable liquids every day. In such competitive industries of high-efficiency advancements, there tend to be higher risks involved, which will require an equally higher efficient safety precaution and fire protection. The partnership formed between Jet Fuel Tank Farm and Tyco Fire Suppression & Building Products (TFS&BP), two distinguished organisations, successfully established ANSUL Foam Fire Suppression System and ancillary equipment as a trustworthy name in providing uncompromised quality and efficiency.

Established in 1962, Washington Dulles International Airport operates as a major hub for domestic and international air travel with eleven domestic legacy and low fare carriers and 22 international carriers. Located in the capital city of United State of America (USA), they fly all year round and provide air services throughout the world.

For a major airport in USA's capital city like Washington Dulles International to operate smoothly every day, it is necessary to advocate efficiency to properly handle fuel storage tanks as well as to ensure employee safety.

As the world's leading special hazard fire suppression brand in the industry, ANSUL – a premium brand of TFS&BP – offers the widest selection of premium foam agents and equipments. With over 70 years of industry experience and expertise in special hazard fire suppression, TFS&BP extensively researches and focuses on developing premium technological solutions and improving existing ones. With ANSUL's sophisticated and competent Foam System installed, the Jet Fuel Tank Farm is now properly equipped to combat fire hazards,



providing peace of mind to facility staffs and owners.

The Jet Fuel Tank Farm owns six storage tanks, which hold over 14 million gallons (52 million litres) of Jet-A Fuel. With numerous expectations and responsibilities to fulfill in the fuel storage facility, the organisation will need to raise their safety and security standards, in such volatile environments as the airline industry, where there may tend to be tremendous fire risks and chemical hazards. There should be maximised attentiveness and safety measures particularly in situations that can lead to devastation and loss of lives. The substantial amount of Jet-A Fuel stored in the Jet Fuel Tank Farm at Washington Dulles International Airport must be equipped with superior firefighting



foam system that rapidly responds and puts out fires.

To protect stored flammable liquids and hydrocarbons particularly those in fixed-roof storage tanks, ANSUL fixed foam suppression systems are applied through one of the following methods of protection (a) foam monitors and handlines, (b) surface application with fixed foam discharge outlets, (c) subsurface application or (d) semi-subsurface injection methods. ANSUL's biodegradable foam equipment and concentrates are both Underwriters Laboratories (UL)-listed and Factory Mutual (FM)-approved. The system is designed to optimize performances while minimizing environ-

drivers will vary depending on the application and type of foam used.

The ANSUL foam system therefore functions with each component ideally in place. Customized and designed to cater to the needs of the airline industry dealing with fuel storage, the impressive suppression system provides superb quality and enhances efficiency with the discharge of foam to put out fire hazards. With the system's intricate considerations whether in design, equipment selection, foam agent application or installation of fixed foam systems, ANSUL foam systems assure maximum efficiency in fire combats particularly in hazardous industries.

Customized and designed to cater to the needs of the airline industry dealing with fuel storage, the impressive suppression system provides superb quality and enhances efficiency with the discharge of foam to put out fire hazards.

mental impact. Functioning effectively to its utmost capabilities, the system convincingly overcomes fire hazards and chemical risks. Fixed with discharge devices such as Foam Monitors, Foam Chambers and proportioning equipment like Pump Skids, the fixed foam system operates cohesively to produce foam solution and direct its flow at the point of application.

The Balance Pressure Pump Proportioning System (Pump Skid) was the chosen design for delivering the foam solution to the tank farm. While foam concentrate is pumped from the tank to the proportioner, an automatic pressure balancing valve matches foam concentrate pressure to water pressure. Positive displacement pumps are used with this system to allow maximum efficiency for liquids of varying viscosity. The size of pumps and

Just as the fuel storage facility looks to the most advanced material, machinery and technology in the aviation industry, so too must there be adequate measures in place to safeguard against these increased risks. As increasingly advanced fuels and machineries pose ever greater fire hazards and volatility, the millions of dollars and livelihoods invested in these industries are constantly at stake. **APF**



by Tyco Fire Suppression & Building Products

For more information, please contact:

Tyco Fire Suppression & Building Products – Asia Pacific

2 Serangoon North Avenue 5
#07-01 Fu Yu Building
Singapore 554911
Tel: +65 6577 4360
Fax: +65 6481 8791
Email: sales-ap@tycofp.com
Website: www.ansul.com

Security systems from Bosch for World Expo 2010 in Shanghai, China

Full security for visitors provided by state-of-the-art video surveillance and public address systems.

Bosch systems contributing to smooth and efficient running of the event.

700 Bosch cameras and a Bosch Allegiant Matrix System protect the prestigious China Pavilion.

Over 800 Bosch cameras and Bosch Public Address system with 1,600 speakers installed in the Expo Axis.

BOSCH SECURITY SYSTEMS is one of the principal suppliers of security equipment for the World Expo 2010 in Shanghai, China.

This event of global significance, which opened on May 1, 2010 and is scheduled to run until October 31, is expected to receive between 70 and 100 million

visitors. Within the 5.3 square kilometer Expo site, exhibits from 192 countries and 50 organizations are on show. Over the six months that the exposition will run, it will host around 20,000 cultural performances.

China Pavilion

The China Pavilion is one of the largest and most important buildings in the exposition and will be among the legacies to be left in place at the end of World Expo 2010. It highlights the host country's long-standing history and time-honored culture.

To protect visitors to the China Pavilion, nearly 700 Bosch high-performance cameras were installed inside and outside the pavilion to offer comprehensive real-time monitoring of areas such as the surroundings, interior exhibition rooms and elevators. The Bosch Allegiant 8900 Matrix System was installed in the central control room of the pavilion. Offering full matrix switching capability, the system displays video from any camera on any monitor and provides powerful alarm handling capabilities.

Expo Axis

Connected to the China Pavilion, the Expo Axis is the central boulevard of the Expo site and consists of steel-glass funnels with a 1,000 meter long membrane construction. The Expo Axis project is the largest single project at the Expo site, and adopts a whole new architectural form.

The Expo Axis has been fully equipped with a Bosch advanced video surveillance system comprising more than 800 Bosch cameras and a Praesideo digital public address system connected to more than 1,600 speakers installed within the structure's magnificent architecture.

Expo Center

The Expo Center is one of the most important permanent venues in the Shanghai Expo site, and takes on the functions of an operational command center, Festival Conference Center, Press Center and the Forum Center. After World Expo 2010, the Expo Center with more than 60 meeting spaces will become one of the leading international conference centers in the country. Bosch provided the DCN NG Digital Conference System for Expo Center.

**For more information, please contact
Bosch Security Systems
Tel: +49 89 6290 1647
Email: erika.goerge@de.bosch.com
Website: www.boschsecurity.com**

Fike offers VESDA ECO™ aspirating smoke detection plus gas detection and environmental monitoring

FIKE announces the expansion of its fire alarm and detection products to include a new solution that combines aspirating smoke detection (ASD) with gas detection and environmental monitoring.

VESDA ECO™ by Xtralis™ uses new or existing VESDA pipe networks to reliably detect smoke and up to nine hazardous/combustible gases. It also integrates easily with other building management systems for real-time situational awareness and intelligent emergency response.

Invisible hazards can originate from the release of toxic gases, oxygen deficiency, or the presence of combustible gases/vapors. With a VESDA ECO detector installed on a VESDA pipe network, air can be conditioned or filtered to remove moisture, dirt and other particulates that can cause traditional gas-detection systems to false alarm or become contaminated.

Each VESDA ECO detector can house up to two gas sensors, and additional detectors can be added easily to the pipe network to monitor more gases if required. In its initial release, the solution can be configured to detect ammonia (NH₃), carbon monoxide (CO), hydrogen (H₂), hydrogen sulfide (H₂S), methane (CH₄), nitrogen dioxide (NO₂), oxygen (O), propane (C₃H₈) and sulfur dioxide (SO₂).

VESDA ECO provides point, zone or total-area coverage to suit different applications in a wide array of

environments, including battery-charging rooms, underground utility tunnels, boiler rooms, manufacturing facilities, parking garages and transportation centers.

Fike Vice President and General Manager Jeff Moore says, "Fike has long partnered with Xtralis to market the highly effective VESDA ASD technology. The new VESDA ECO system will provide Fike customers across a wide array of industries with early warning fire detection, protection against hazardous gas leaks, air quality monitoring to ensure safe working environments, and help in reducing energy consumption and costs. This new solution is also compatible with Fike's complete product offering, including our intelligent and conventional control systems and event management software packages."

VESDA ECO easily integrates with Fike's complete line of fire alarm control panels, as well as programmable logic controllers (PLC), heating ventilation and air conditioning (HVAC) systems, and building management systems (BMS).

Fike is a globally recognized supplier of products and services that protect people and critical assets from dangers such as fire, explosions, and over-pressurization. With over 60 years experience manufacturing safety solutions, Fike offers a complete line of proven, reliable products to customers around the world.

**For more information, please visit
www.fike.com**

The world's best-selling TETRA Gateway just got better

SRG3900 TETRA Gateway Repeater

Sepura announces the unveiling of its new Colour Console and SRG3900 TETRA Gateway Repeater radio at the TETRA World Congress 2010 in Singapore.

The SRG3900 is the latest evolution of Sepura's market-leading SRG3500 gateway radio, which has become the TETRA gateway of choice for users from around the globe. The SRG3900 incorporates all of the market leading features of the best selling SRG3500 gateway* and repeater** including dual console support and outstanding 10 Watts RF Power – which gives this radio the greatest operational range of any TETRA 2 terminal on the market today. It also supports the enhanced colour user interface of Sepura's flagship STP hand-portable, already well-known to Sepura users.

The new Sepura Colour Console (SCC) complements the SRG3900 radio. The console's large high resolution colour screen allows the display of high quality



photographs and maps. With the introduction of three text mode sizes and a new 'night mode' which reduces glare – ideal when driving at night – Sepura has taken every possible care to ensure an enhanced user experience.

Together, the SCC and SRG3900 incorporate many of the market-leading features of Sepura's flagship STP8000 hand-portable that Sepura users find particularly beneficial during busy periods, such as a very large mode text, context keys – for a more intuitive use – and missed events

notification. In addition, the SCC offers high levels of water and dust protection (reflected in its IP67 rating) which make it ideal for installations on motorbikes and fire engines. With the addition of the Sepura Colour Console to its product portfolio, Sepura now offers the widest range of consoles in TETRA.

The SRG3900 and the SCC are both 100% backward compatible with existing installations of Sepura radios; organisations will be able to upgrade to the new SRG3900 or SCC without the need to rewire their vehicles, hence saving considerable time and cost.

Mark Barnby, Product Manager for Sepura commented: "At Sepura we are fully aware that our customers' investment in TETRA equipment and vehicle

installations can be considerable. When we introduce new products we make sure that, wherever possible, we minimise the installation costs. Both the new SRG3900 and Colour Console are perfect examples of this ethos; they simply plug into existing cabling and mountings. The savings generated for customers by this backward compatibility prove once again Sepura's proactive response to meeting the needs of the market".

Steve Barber, Head of Product Strategy for Sepura added: "We are proud to announce in this very special forum of the 12th TETRA World Congress, that the SRG3900 Gateway TETRA radio, the Sepura Colour Console (SCC) and our new accessories are 3 ready to order NOW. We are confident that the technology enhancements incorporated in the SRG3900 make it the most competitive TETRA product in the market today".

The **gateway acts as a relay point for both hand-held and other vehicle radios, extending the trunked network into areas of limited coverage or network dead spots usually found inside buildings, deep inside tunnels or in remote rural locations.*

***The **repeater** allows multiple direct mode users to exchange voice and data messages reliably over a wider area, and in areas with no existing network coverage.*

For more information, please contact:

Rosanna Norman, Sepura plc

Tel: +44 (0) 1223 877283

Email: rosanna.norman@sepura.com



SRG3900 TETRA Gateway Repeater

The New Standard for Technical Search and Rescue Cameras

The SearchCam® 2000, the original technical search and rescue camera set the standard for audible and visual victim location. The new SearchCam® 3000 does it all over again, incorporating design improvements gained by years of real-life rescue experience from around the world. The SearchCam® 3000 is four cameras in one ... Handheld Search Camera, Standard Probe Camera, Cable Probe Camera and Super Probe camera. This modular design gives the end user extreme value for the money.



Imagine the versatility of this modular design for in one instance you can vertically drop the camera head 25m into a well or elevator shaft and it fully water proof to this depth (supplied environmental sleeve is required). Or you can attach the standard probe to horizontally enter a void up to just under 3m. With the optional tube sets the SearchCam® 3000 converts to a SuperProbe extending the cameras reach to over 5m to view debris on the second or third floor of a building. For tight spaces like in vehicle extrication the camera head module can be handheld by the user. In all instances the operator can control the LED lighting and powered camera articulation that now expands the view to 240°.

The SearchCam® 3000 has the ability to take individual digital images or full motion video with sound. These are saved to a standard Secure Digital High Capacity (SDHC) memory card which can be transferred easily to a desktop or portable computer. Ideal for keeping a record of the event or viewing video/images out of bright sunlight or inclement weather. Another new feature is the Quick Connect camera head. Currently we have the choice of a color camera with LED lighting or a low light CCD black & white camera with infrared lighting with more camera options to follow in future.

Users of the original SearchCam® 2000 will be impressed with the new power system that eliminates the use of the heavy lead acid belt worn packs and replaces it with two small Lithium Ion battery sticks. Also gone is the video cable sticking

out of the back of the camera. By using a specifically designed cable integral to the modular tube sets the external probe extension cable has been completely eliminated. If that weren't enough the articulation mechanism and boot assembly of SearchCam® 2000 has been removed all together and replaced with a new and improved Articulating Camera Head. The rugged, gear-driven camera head is now clutch equipped to protect the motor and gears from damage during use and sealed ball bearings ensure smooth operation with minimal maintenance.

Of course the SearchCam® 3000 maintained the ability for two-way communication and is supplied with a comfortable high noise headset.

All in all the SearchCam® 3000 is an accumulation of direct feedback from our global customer base of rescue professionals. Our goal is to the design and build the best Technical Search and Rescue products in the world and provide ongoing value for our customers. Which is why we are incorporating cross functionality with the Delsar Family of Acoustic/Seismic systems as well. The two systems now share the same battery Lithium Ion format and as of May 17, 2010 the Delsar Acoustic Sensors can utilize the SearchCam 3000 tube sets.

We would like to thank our loyal rescue customers and welcome new users to contact us or our distribution partners to find out more about our equipment. We are confident that we offer the most rugged, reliable and proven technical rescue equipment anywhere.

APF

For more information, please contact:
Con-Space Communications Ltd.
 280-13775 Commerce Parkway
 Richmond BC
 V6V 2V4
 Canada
 Tel: +1 604 244 9323
 Fax: +1 604 270 2138
 Website: www.con-space.com

ISRP samples the fragrant air of Hong Kong

Respiratory protection for fire-fighters and other emergency responders is likely to be high on the agenda at an international conference in the Asia-Pacific region.

Hong Kong means *fragrant harbour* and is the apt setting for the 15th international conference of the International Society for Respiratory Protection (ISRP), taking place in September 2010.

The conference promises to be a major item on the events calendar, with dozens of papers being presented over four days. Several presentations, along with keynote addresses from invited local authorities, are expected to cover the field of respiratory protection in fire, rescue and emergency response operations, as well as post-event activities such as forensics and fire investigation.

The Society has been staging biennial conferences around the globe since 1984, but this is the first time such an event has been located in China. Previous conferences have been conducted in as diverse places as Dublin, Vancouver, Sydney and Yokohama.

Journal

The ISRP was founded in 1983, and has been a respected forum for respiratory protection professionals ever since. The Society has been publishing its own Journal since the inception. The entire corpus of scientific papers, articles and discussion documents is now available both in print and free on-line to all members of the ISRP. The archives comprise around 100 issues, or well over 5,000 pages of highly useful knowledge and findings.

Non-members will find hundreds of abstracts from past conferences at the ISRP web site.

Recent ISRP conferences have often focussed on current world-wide concerns, including terrorism and chemical threats, as well as the emergence of SARS, various influenzas and other pandemics, and the selection and use of respiratory protection for emergency personnel working in the risk zone.

Other topics include breathing physiology (for instance the compatibility of respiratory protection and physically hard work, such as fire fighting and rescue), the design and manufacture of respiratory protective devices, new research, and methods of testing and evaluating respirators.

The theme of the Hong Kong event is *Respiratory Protection: what lies ahead?*

New initiative

During the past few years, the ISRP has been working on producing and conducting a world-wide



educational program on respiratory protection for developing nations and other places where the awareness of occupational safety and personal breathing protection may be lacking. It has become evident (especially through papers presented at recent ISRP conferences) that respiratory protection could be put to much better and wider use in many countries, where personal protective equipment might be virtually unknown in many workplaces.

Indeed, speakers from Africa, Asia and Eastern Europe have expressed concern over the lack of awareness of breathing hazards in their homeland.

The new ISRP educational initiative comprises various training programs, induction material, on-site instruction, product demonstrations and much more. The project is now approaching completion, and pilot programs have been put in action — the latest one tailored for medical and hospital personnel in Cambodia (conducted in May 2010). The results of this program are sure to come to light at the upcoming ISRP conference.

Hong Kong conference

The 15th ISRP Hong Kong conference runs from the 26th to the 30th September 2010 at the Langham hotel in Kowloon. Apart from several days of podium presentations, there will be workshops and round-table sessions on respiratory protection, as well as many social events such as a cocktail party, excursions, an exhibition, and a gala banquet dinner, all with plenty of opportunities to meet respiratory professionals from all around the world, make new acquaintances, and network with people in the field.

All people connected to any facet of respiratory protection are welcome not only to attend the conference, but also to submit and present papers. **APF**

For more information about the International Society for Respiratory Protection, membership and the Hong Kong conference please visit www.isrp.com

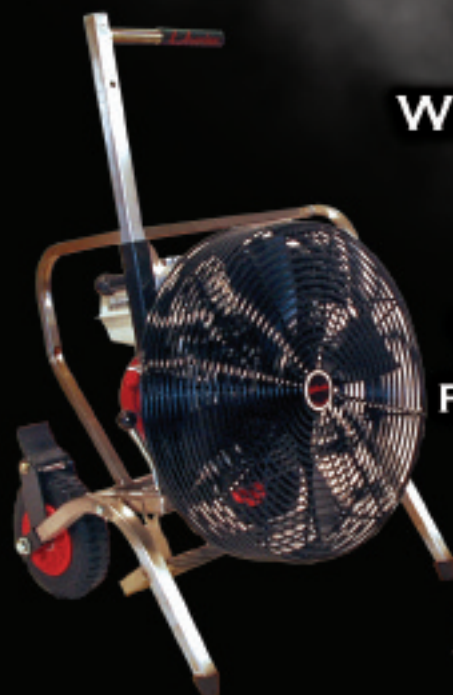
UNIFIRE

MANUFACTURERS OF HIGH PERFORMANCE EQUIPMENT



WHEN TIME MATTERS.
WHEN LIVES ARE AT STAKE.
WHEN SAFETY IS KEY.

CHOOSE THE BRAND
THE TOP TRAINING AND
RESCUE TEAMS CHOOSE.



UNIVENT BRAND SAWS ARE A DIVISION OF UNIFIRE

1-800-745-3282 • WWW.UNIFIREUSA.COM

Cutters Edge® MULTI-CUT® FIRE RESCUE SAWS

Cut Anything!

CUTTERS EDGE® gasoline powered **MULTI-CUT® FIRE RESCUE SAWS** are built stronger to work harder and operate longer in the most extreme fire and rescue conditions

CE735R MULTI-CUT® ROTARY RESCUE SAW



The CUTTERS EDGE® MULTI-CUT® ROTARY RESCUE SAW has a Hemispherical Head Piston and High Torque Gear Ratio for maximum power. Its BLACK DIAMOND™ Cutting Disc will **cut any material** - metal, concrete, composites, plastics, bullet-proof glass...ETC. And just one BLACK DIAMOND™ Cutting Disc can last as long as 100 other blades!



CE101C CONCRETE CUTTING CHAINSAW



This CONCRETE CUTTING CHAINSAW cuts 16-inches (40cm) of reinforced concrete. Its GCP SealPro® Diamond Chain is lubricated and cooled with water so there is no dust.



MULTI-CUT® FIRE RESCUE CHAINSAW



The MULTI-CUT® FIRE RESCUE CHAINSAW has a Guard to protect the operator and the Carbide BULLET® Chain cuts more types of materials, stays sharp and will last longer than any other chain!



All MULTI-CUT® FIRE RESCUE SAWS are available in a custom Aluminum Box that includes all accessories, tools and spare parts to get the job done at any emergency.



MULTI-CUT® Rotary Rescue Saw Kit



Concrete Cutting Chainsaw Kit



MULTI-CUT® Fire Rescue Saw Kit



The International Search & Rescue Response to the 2009 Padang Earthquake

At 17:16 on 30th September 2009 a magnitude 7.6 earthquake rocked South East Asia. The effects were felt from Jakarta to Singapore, but the Sumatran city of Padang, just 28 miles from the epicentre, felt the full force of the earthquake. On the morning of 1st October the government of Indonesia issued a request for international Search and Rescue assistance. Teams from around the world, including four British teams, had already begun making arrangements to deploy to Indonesia and SARAID was one of the British teams that deployed.

By Ian Turner

SARAID

SARAID is a Non-Governmental (NGO) UK International Search and Rescue Team operated entirely by volunteers and funded by public and business donations.

An NGO is one of the two types of teams that often deploy on international search and rescue missions, with governmental organisations being the other dominant type of organisation. Government sponsored search and rescue teams often make up the large teams on a deployment, travel-

ling using either military or chartered aircraft, backed by significant national resources. Whilst the NGO's are often smaller, they are no less important. Being non-governmental, they often have the ability to deploy faster with permissions and paperwork being less of a problem, although they are often restricted to scheduled flights which can pose a major problem for deployment.

The other major difference between NGO's and governmental organisations is that NGO's often



have a more diverse background than a governmental sponsored search and rescue team. The SARAID team deployed to Indonesia was only 10 people but within that team there was a Doctor, a Structural Engineer, full time USAR specialists, a Policeman, an Emergency Planner, a Mechanic and an Electrician. A diverse skill set is a key component of any international search and rescue deployment just because of the range of problems that needs to be addressed so these diverse NGO's are equally as important as the larger more heavily resourced governmental teams.

Although the development of international search and rescue teams is now supported by the United Nations, there are no international laws or restrictions on a search and rescue team deploying from one country to another following a disaster. All teams that deploy are considered guests in the host country, operating under the host country

laws and directed as necessary by the host countries Local Emergency Management Authority (LEMA). In principal this means that anyone can deploy to help after a disaster, but in practise this creates huge problems. The host country often has severely restricted resources to both support and co-ordinate.

To deal with this problem, INSARAG (International Search and Rescue Advisory Group) has set up guidelines for international search and rescue teams to set out minimum standards for search and rescue teams and is currently undertaking assessments of teams against the guidelines. If teams adhere to these minimum standards, the co-ordination and the resourcing of international search and rescue teams will be significantly improved.

All international search and rescue teams that operate in accordance with the INSARAG guidelines are now expected to achieve a minimum technical standard in a range of skills including Urban Search and Rescue. Core technical skills of international search and rescue teams include:

- Rescue including breaching and cutting, shoring, rigging and lifting and moving
- Medical including hostile environment and personal health training for team members. Team medics need to be able to access casualties to stabilise them deep with buildings and need to be able to give some life support for a casualty until they have been removed to a medical support environment
- Technical skills including engineering, equipment maintenance, hazardous materials assessment and needs assessment
- Self sufficiency including sourcing and purifying water, field craft, survival, cargo handling for the equipment
- Command and control including the ability to run or take over a reception or coordination centre
- Search including reconnaissance, technical search and canine search.



CON-SPACE

COMMUNICATIONS

TECHNICAL SEARCH



SEARCHCAM®
3000

- Waterproof camera head, submersible to a depth of 75 feet (23m)
- Clutch equipped gearbox, 240° articulating camera
- Adaptable modular design



- Locate live victims in collapsed structures
- Rugged, portable & easy to deploy
- Used by Search & Rescue teams around the world

CON-SPACE

hardline

- Portable, self powered, intrinsically safe
- Secure, uninterrupted communication
- Confined space, collapse, trench, high angle, mine



WATCH THE VIDEOS ONLINE.
www.con-space.com

THE ORIGINALS in Rescue Equipment

Rescue equipment

*The power of
innovation*

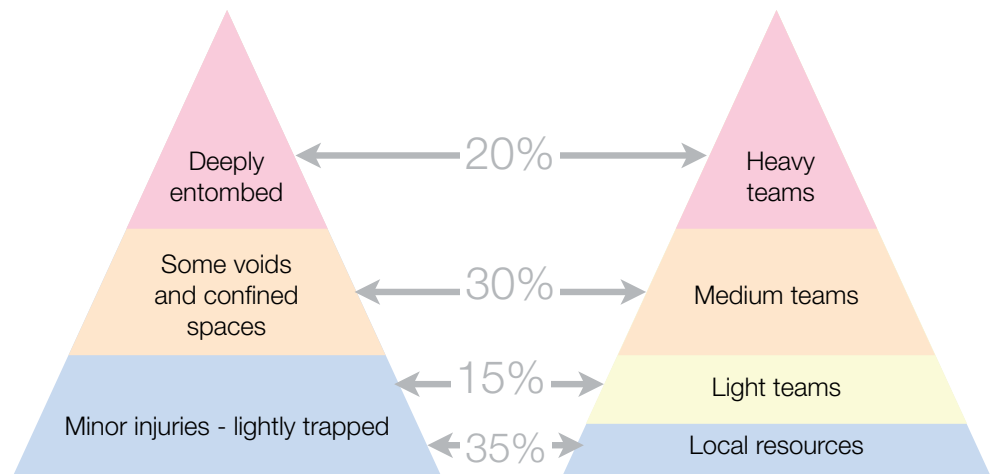
Our New Car Technology
cutter CU 4055 C NCT II has
all it takes to cut the latest
vehicle models:

- >103 tons cutting force
- 202 mm blade opening
to surround wide B- and
C-posts
- U-shaped blades, to pull
material into the recess,
the point with the highest
cutting force
- i-Bolt for less blade
separation and more
efficient cutting

www.holmatro.com

Holmatro Rescue Equipment BV | The Netherlands
T +31 (0)162-589200 | F +31 (0)162-522482 | E rescue@holmatro.com

holmatro
mastering power



The other key element of the INSARAG assessment system is classifying teams as either – Light, Medium or Heavy. This classification system is intended to improve co-ordination and management of teams responding to a disaster, assigning clear capabilities to teams of different sizes.

Light teams are local teams travelling from adjacent countries. These teams are intended to rapidly bring technical and canine search capability to the disaster as well as a light rescue capability. The medium teams are the smaller teams that travel long distances. Typically these teams are made up from 20 to 30 people and a diverse but relatively lightweight equipment cache. Medium teams therefore provide a full search and rescue capacity, but remain relatively mobile. The SARAID team is designed so that it can travel on a single 50 person bus. Disasters such as the 2005 earthquake in Kashmir show how important mobility is in providing a disaster response.

Heavy teams are usually made up from at least 70 people. These teams bring a full search and rescue capacity with the ability to work on a single large site with no additional support, something that smaller teams could not achieve. These teams also have the capacity for the massive campaign rescue efforts needed to rescue people deeply entombed in large buildings, something that the smaller and medium teams could not achieve.

The INSARAG guidelines show the importance of a diverse response with the diagram in figure 1 which shows the proportion of casualties normally expected to be rescued by the teams of different classifications.

A total of 21 international search and rescue teams deployed to Indonesia from around the world, all arriving within the first 2 days following the earthquake.

The SARAID team self deployed to Indonesia through scheduled flights with Qatar Airways.





PROTECTING THE WORLD'S FIREFIGHTERS



Bristol - A global force in firefighter protection

Relied upon by firefighters in over 110 countries, Bristol can confidently claim to be a global leader in the specification, design and manufacture of firefighters' personal protective equipment (PPE). We deliver our world class products and support services through a network of 70 specialist distributors worldwide, while commanding a dominant share of the UK market.

Bristol Uniforms Ltd

Bristol, United Kingdom, BS16 5LL
Tel: +44 (0) 117 956 3101
enquiries@bristoluniforms.com
www.bristoluniforms.com



BIOex advanced quality

1 Ton
of AFFF
= 10 kg
of fluorosurfactants (PFC)
= 2 Million M3
of contaminated water

FLUORINE FREE Foam
The alternative

www.bio-ex.com

PADANG EARTHQUAKE



Having a Search and Rescue turn up at the airport needing to deploy with a lot of equipment is always a challenge for the airline, but Qatar Airways proved to be more than capable of dealing with the challenges. Qatar Airways flew the team to Jakarta Soekarno-Hatta International Airport via Doha and Singapore, where the team were met by Indonesian Civil Defence. Even a task as simple as changing terminals at an airport can be a challenge when you have to carry a full

equipment cache. It took just 4 large taxis and a pick-up to transfer the team and the equipment, a major benefit of being a small team travelling as light as possible.

Flights from Jakarta to Padang were provided on chartered planes free of charge to both national and international rescue teams. Our flight included other rescue teams from the UK, France and Canada as well as representatives of the UN and Indonesian National Rescue teams.

The International
FIRE & EMERGENCY
TRAINING LEADER



TRAIN ■ SERVE ■ RESPOND

TEEX trains emergency response personnel from more than 45 countries each year. Each course can be tailored to meet your exact needs in a variety of areas.

- Municipal / Industrial Firefighting
- Industrial Emergency Response Specialist
- Hazardous Materials Response
- Search & Rescue / USAR
- Aircraft Rescue & Firefighting
- Fire & EMS Leadership
- Fire Officer / Instructor
- Marine - Shipboard Firefighting
- Oil Spill Response
- Emergency Medical Service
- Emergency Management / NIMS
- Incident Command
- LNG Emergency Response
- Assessment / Technical Assistance

Schedule these or any of our 130+ courses today.
www.teex.org/fire • 1.866.878.8900

 **TEXAS ENGINEERING EXTENSION SERVICE**
A Member of The Texas A&M University System
2601 Berwick • College Station, TX 77843-2698



Arriving at the site of a disaster of the scale of an earthquake is always a challenging experience. We do everything we can to find out about the place we're going to, but the reality is you really never know what you are going to encounter. Reading through the media reports on the way to Indonesia, it seemed like there was a lot of damage and casualties, but we knew that the depth of the earthquake and the relatively slow rise in the number of reported casualties means that the media reports may not be giving a full picture.

Arriving at Padang it was soon very clear that, whilst it was a major disaster, it was not of the same scale as other massive earthquakes in recent years. The airport was operating normally, and despite being within 20 miles of the epicentre, suffered no major damage. The first task of any rescue team once they arrive is to head to the designated Reception Centre. This gives teams a chance to immediately slot into the coordinated international response to the disaster. Our team leader and deputy then took a taxi to the main on-site coordination centre to get any Taskings for the team whilst the team set up camp with some help from Russians and French teams.

After meeting at the co-ordination centre the SARAID team was tasked to support the Singapore Civil Defence team in clearing an area that had up to that not been searched, south of the river in Padang. We had to arrange for our own transport, and as soon as we had met and coordinated with the Singaporeans we departed to undertake the reconnaissance.

Whilst there were localised collapses of single buildings, or groups of buildings, it was clear that the city had been very lucky. Life in the city was clearly carrying on like normal for many people. They still had to go out to work to earn a living for their families, and the collapsed buildings and rescue operations were even providing a lot of interest with local people touring the city, just watching and taking photographs. It seemed like only the most vulnerable buildings had suffered this time.

We completed our reconnaissance relatively quickly and had only one more task to undertake. A large section of one of the hotels had collapsed and whilst one deceased had been brought out of the building, another missing person remained in the building. We assisted the Singaporean team in undertaking this search in a somewhat complicated situation with a wide variety of skills being using

including canine search, technical search, tunnelling and shoring and layering of the building using heavy lifting equipment. Eventually the missing person was identified as having deceased and the effort was called to an end.

Having been deployed in the country for just short of 48 hours, we had to arrange our own transport back out of Padang to Jakarta where we could catch an international flight.

Thanks to the generosity of the Royal Australian Air Force we arranged for the team and equipment to be flown back to Jakarta on the return leg of a C-130 aid flight. Whilst it was a very uncomfortable flight, to begin the long journey home safe and well was welcomed by all the team members.

The SARAID team returned back the UK a little over a week after beginning the deployment. All team members returned safe and well to begin the long task of preparing the team for the next deployment.

APF

Ian Turner has been involved in as a volunteer in International Search and Rescue for 10 years and has been operational with SARAID for over 5 years. His experience includes missions such as the 2005 Kashmir earthquake and a mission to Sri Lanka following the 2004 Tsunami. Ian is a full time tunnel design engineer working on major tunnel projects around the world and operates as a rescue engineer within the SARAID team.

Super Vac SVU Blows Up a 425,000 cmh Windstorm!

The Super Vac SVU is useful in situations where a district includes large retail outlets, warehouses, public sites, tunnels, or airports. It can easily mount on trailers, skids, or trucks. Optional features include, lift, tilt, rotation, water misting and lighting. Contact your dealer for more details on ...

**"The Most Powerful
PPV Available"**

 **SUPER VAC**
THE VENTILATION SPECIALISTS

Super Vacuum Manufacturing Co., Inc. • P.O. Box 87 • Loveland, CO 80539 USA

www.supervac.com

Tel: +970 667 5146



When asset protection matters most. DuPont™ FM-200®

DuPont™ FM-200® clean agent can reach extinguishing levels in 10 seconds or less, stopping ordinary combustible, electrical, and flammable liquid fires before they cause significant damage. When fire is extinguished that quickly, it means less damage, lower repair costs, and an extra margin of safety for employees and valuable assets—making it easier to keep your business running smoothly.

Make sure your business is protected with the most widely specified clean agent in the world. Get maximum protection with DuPont™ FM-200®.

1.800.473.7790
cleanagents.dupont.com



DuPont Fire Extinguishants. The Science of Protection.™



The miracles of science™



Fire Suppression

By **Alfred Thornton**

DuPont Fire
Extinguishants

With increasing corporate and societal attention on product stewardship and sustainability as part of achieving long-term environmental goals, many companies are looking at ways to improve the environmental profile of their facilities and processes by selecting an environmentally preferred fire suppression solution.

The fire suppression industry has been at the forefront of adopting practices in support of responsible product use since the Montreal Protocol regulations came into effect more than twenty years ago. Industry-driven voluntary codes of practice have helped ensure that the societal benefits of fire suppression agents are maintained while environmental impact is minimized.

It is important to consider all key criteria when choosing a safe, effective and environmentally responsible fire extinguishing system. It would be a mistake to focus on only one aspect of a system, such as the global warming potential or GWP of the extinguishing agent. The reality is that an agent's GWP contributes to climate change only if the agent is released into the atmosphere. Fire suppression industry data indicate that minimal amounts of extinguishing agent are ever released to the atmosphere since most suppression equipment doesn't encounter a fire scenario.

Voluntary codes of practice within the industry have established best practices for installing, maintaining, and servicing fire suppression systems, and these measures have proven highly effective in controlling and reducing unwanted emissions. The industry has also been working closely with the U.S. Environmental Protection Agency (EPA) to develop a reporting program to track fire system emissions, the HFC Emission Estimating Program (HEEP).¹

In fact, worldwide emissions from fire protection, including fire events, are estimated to represent less than 0.02% of total greenhouse gas emissions

on a CO₂ equivalent basis and less than 1% of emissions from the basket of gases manufactured for use.

To put these volumes into further perspective, the average fire system in the U.S. contains about 155 kgs of extinguishing agent, meaning an average system releases about 4.5 mt CO₂ equivalent. According to the U.S. EPA, this release rate equates to the same GWP impact of 9/10ths of a passenger car or [less than half] 4/10ths of your home's annual energy use.²

What about the future environmental risk of an ever-growing base of protected facilities? The HEEP data shows emissions from fire systems leveling off, indicating that system emissions are not directly tied to the number of installed fire systems. System installations have increased consistently every year over the period of the HEEP data, from 2002 to 2008, yet the volume of emissions from that growing base remains the same. One explanation for this non-intuitive data is that the number of fire and false discharge events is steady, no matter how many sites are protected. Further, the industry currently has a well-established maintenance, recovery and reclamation infrastructure, providing a robust global market for recovering and reusing clean agents in new fire extinguishing systems, recharging existing systems after fires, and removing agents from use through conversion or destruction technologies. Over the years, these maintenance and recovery programs have become more refined and efficient proving that, with proper care and



market incentives, emissions can be reduced, agent and system sustainability can be attained, and environmental responsibility can be realized.

Since clean agent fire systems have a low emission impact, how should an end-user (i.e., facility manager, building owner, and administrator) evaluate and make the best choice in a fire suppression system? Fire suppression systems should be considered as an integral complex system, including, but not limited to, the choice of agent. Just as the science and politics of climate change are complex and interrelated, so too, the choice of the right fire suppression technology for any given application is more than a single component or even sum of components, and requires careful decision making.

First, it is critical to ensure that the performance of the suppression system properly matches the application. Protection of life and health must be the top priority, followed by protection of property and the environment. Selecting a suppression system with the main focus on achieving an arbitrary GWP target not only wastes resources but may ultimately prove to be a worse choice environmentally as well. A high quality system from a recognized manufacturer, carrying an internationally recognized approval (such as Underwriters Laboratory, VdS, or Factory Mutual), helps ensure the system performs as expected, releasing only during a real fire event. Proper service and routine maintenance by trained technicians with respected service firms will enable the suppression system to protect lives and property from fire.

In evaluating the environmental impact of a fire suppression system, it is important to consider the quantity of equipment required, including system storage space, as well as installation and servicing costs. Achieving the same hazard protection goals with physically larger, more complex fire systems can increase a facilities overall environmental impact. Systems utilizing efficient, high performance extinguishing agents such as DuPont™ FM-200® reduce resource requirements, going back to the hardware manufacturing process; they also require less floor space, thus reducing all of the attendant operational costs associated with managing a highly protected risk facility. According to a Data Center News article³ the operational cost of a U.S. data center ranges from \$80-\$112/ft²; a large part of that cost goes to power and environmental controls. Displacing functional floor space to accommodate a less efficient fire system increases the

operational overhead requirements for these facilities and creates an added environmental impact over the lifetime of the installation.

When considering the overall environmental performance of your facility, consider LEED® (Leadership in Energy and Environmental Design) standards. The U.S. Green Building Council (USGBC), a non-profit coalition of building industry leaders, developed LEED® to establish a common standard of measurement for environmentally sustainable building practices. Several clean agent fire extinguishant options contribute toward LEED® credits in the Energy & Atmosphere category, contributing toward USGBC Certification. Money saved by choosing a high performance, cost-effective fire suppression system can be used to upgrade building materials or for other energy performance enhancements. Improvements in these other operational areas are weighted five to ten times more heavily in the LEED® certification process than improvements related to fire systems. Focusing limited resources on areas that provide the greatest return is both fiscally prudent and environmentally responsible.

It is certain that "sustainability" will continue to be a growing concern for critical facilities. Facility managers, building owners, architects and design engineers will continue to review and examine options for improving a site's environmental profile and fire systems are not exempt from that process. By combining a safe, effective fire suppression system that offers the highest performance with an efficient use of space, energy and capital, owners can focus their resources on making a real difference in reducing a company's environmental footprint.

For nearly two decades, HFC clean agents have clearly demonstrated they offer the best balance between performance, economic value, and environmental responsibility for the special hazards fire protection industry. To choose a fire suppression system based solely on the GWP of the agent used in the system is to fail to properly appreciate the true impact and importance of fire extinguishing system in the overall protection and operation of a critical facility.

APF

References

- 1 Report of the HFC Emissions Estimating Program, March 2010.
- 2 US EPA Greenhouse Gas Equivalencies Calculator; <http://www.epa.gov/RDEE/energy-resources/calculator.html#results>
- 3 Data Center Locations Ranked by Operating Cost, Data Center News, 25 Jul 2006. SearchDataCenter.com



Manufacturer and Designer
of Globally Approved
Fire Extinguishing Systems



Clean Agent
High Pressure Carbon Dioxide
Low Pressure Carbon Dioxide
Water Mist
Foam
Alarm and Detection
Air Sampling Smoke Detection

YOUR GATEWAY TO A NEW KIND OF SERVICE.

+1 219-663-1600 • www.janusfiresystems.com
1102 Rupcich Drive, Crown Point, IN 46307



FIRERAY® Optical Beam Smoke Detectors

Low cost, field-proven fire protection
for large open areas



When it comes to optical beam smoke detectors no other company has the experience, or the product range, of Fire Fighting Enterprises. **FIRERAY®** offers both reflective and end-to-end models and ATEX approved units for hazardous areas, encompassing all applications.

With over 650,000 beams installed worldwide, including in some of the world's most prestigious buildings, it is clear that the **FIRERAY®** series is the choice for both installers and specifiers.



T +44 (0) 1462 444 740 F +44 (0) 1462 444 789 E sales@ffeuk.com W www.ffeuk.com



FIRERAY® - The leading
light in smoke detectors

STINGER[®] + WIRELESS ELECTRONIC TECHNOLOGY

STINGER RF... YOUR BEST LINE OF DEFENSE

New Stinger RF delivers big water in hazmat and other tough situations where you can't take a vehicle and won't send a firefighter. Stinger RF goes from truck mount to portable in seconds, and you can control it from 1/4 mile away with a hand-held or panel-mount remote. Get in. Get out. Play it safe. Let's talk. Call 1-800-346-0250.



Elkhart Brass
Fire Fighting Equipment

The Most Experienced Manufacturer of Fire Fighting Equipment

Elkhart Brass Mfg. Co., Inc. | 1-574-295-8330 | 1-800-346-0250 | www.elkhartbrass.com





Large Fires Require Large Water and Foam Flows

Fixed, Portable, and Remote Control Monitors Offer Increased Fire Flow Capabilities Safely

Many times the large volume of fire encountered by arriving apparatus quickly precludes the use of standard hand held nozzles for initial attack. In these cases, the movement and accurate delivery of water or foam solution, as well as establishing a constant sustainable water supply, becomes critical to successful extinguishment and exposure protection operations. High flowing portable, fixed and remote controlled monitors provide the performance necessary to meet these high flow challenges even when staffing on first arriving apparatus is limited.

By Rod Carringer

Task Force Tips, Inc.

Fires requiring large volumes of water or foam solution for suppression (high critical application rate) will dictate the water supply and fire streams management operations from the initial arrival of the first apparatus. If the fire has burnt past you, or is generating more BTUs on the fire/time curve than the crew can deal with, the addition of more hand held lines may provide little or no suppression success. Though the use of a pre-plumbed monitor on apparatus and light-weight portable monitors may be rare in many jurisdictions due to the inability to supply an

adequate sustained fire flow, their tactical versatility cannot be overlooked.

Often considered strictly a defensive tool for those large exterior attacks, pre-plumbed master stream devices, manual and remote controlled, and smaller portable monitors can be an effective initial attack option when staffing on the apparatus is limited and the volume of fire upon arrival is substantial. Even with the limits of working from the apparatus water tank, placing a heavy stream from a fixed or portable monitor for sixty seconds directly into the volume of fire can sufficiently darken it



SOLBERG

Solberg offers products of high quality and within the highest technology standards to the international fireprotection market

FIGHTING THE FIRE DRAGON

WITH CLASSIC AFFF/ATC, MODERN ORGANOHALIDES
FREE FOAMS OR CLASS A FOAMS



RE-HEALING FOAM™

Organohalides free foams



ARCTIC FOAM™

AFFF/ATC foams



FIRE-BRAKE FOAM™

Class A foams

Head Office Norway	Australia / Asia
Solberg Scandinavian AS Ølsvollstranda N-5938 Sæbøvågen Norway	Solberg Asia Pacific Pty Ltd 3 Charles St, St Marys, 2760, NSW Telephone (612) 9673 5300 Fax (612) 9673 5303

Emergency Stock Hotline

(Norway)

+47 976 40 000

(Asia Pacific Region)

+612 9963 3148



www.solbergfoams.com



down, so hand held nozzles can be deployed for final suppression. All of this can often be accomplished successfully using only the water on the first arriving apparatus. This sort of "Blitz" Attack is an ideal tool for agencies that struggle with limited staffing yet must manage ever increasing fires.

Keeping in mind the additional water supply requirements, the use of portable monitors and apparatus mounted master stream devices can provide just some of the following benefits.

- Higher initial attack fire flows and increase stream reach can offer improved fire fighter protection by allowing crews to work in more tenable atmospheres while providing higher fire knockdown potential.
- In limited staffing situations, higher fire flows can safely be provided with minimal personnel. Evaluating fire flow performance, typically more gallons per minute per person can be delivered than with any combination of hand held nozzles.
- A single line put in service with a portable monitor can deliver from 2000 l/min (500gpm) up to 4500 l/min (1250gpm) providing a wider range of options to meet changing fire ground conditions. The new lightweight features of the portable monitors offer quick deployment and the



ability to better utilize pump capacity and available water supply during initial attacks. Faster fire extinguishment translates to an overall reduction in the stress level of initial attack personnel.

- A single larger "Blitz" line can have as much effectiveness as up to 5 hand held nozzles with hose and support. This can amount to a large savings in time and human resources.
- Higher flow rates from fixed, remote and portable monitors provide increased reach and penetration over hand held nozzles.
- The high flow devices can support a more effective allocation of personnel resources on the fire scene and allow the first arriving apparatus more tactical versatility.
- Portable monitors can provide unparalleled safety in hazardous material and vapor mitigation procedures, exposure protection, and high flow foam applications with self-educing master stream nozzles.
- The "scale up" feature of starting with a single supply line into a portable monitor followed by a second line, allows the device to be used for a quick initial attack, or upgraded to a larger defensive operation as required by the fire ground commander.

Once you have integrated the use of the master stream into your initial attack operations, the only way to feel comfortable operating these high flowing devices, especially when the water tank on the apparatus is your primary supply, is to practice and understand the capabilities of the equipment and how to properly deliver capacity to the seat of the fire.

Even with the previously noted benefits of using high flow portable or truck mounted appliances, successful suppression strategies often fail due to some of the following reasons.

- Lack of training will always affect the procedures used in proper deployment, placement, advancement, and operation of attack lines.
- Though smaller supply lines are flexible and mobile, their flow capacity is limited. The use of large diameter hose will provide higher flows, but will restrict advancement of the line after flow has been initiated.

Dr Sthamer – Hamburg

**Moussol APS LV
Low Viscosity AR-AFFF
Fire Fighting Foams
Specially Developed for
Ethanol Risks,
Refineries & Storage Facilities**

FOAM FIGHTS FIRE

Proven Reliability.

**24/7 Emergency Supplies
from Stock**

Synthetic Foams

- Moussol APS
- Moussol FF **NEW!**
- Sthamex AFFF
- Sthamex
- Sthamex class A

Protein Foams

- Fluor-Foamousse
- Foamousse FFFP
- Foamousse OMEGA
- Foamousse

Ready To Use Foams

- Fettex
- Mousseal-C
- Mousseal-CF
- Mousseal-ATC

Training Foams

**24/7
EMERGENCY
SUPPLIES
+49 40 73616 80**

We offer a comprehensive range of high performance and environmentally friendly foams.



Dr. STHAMER HAMBURG

Head Office and Factory Hamburg
Liebigstrasse 5 · D-22113 Hamburg
Phone +49 40 736168-0
Telefax +49 40 736168-60
E-Mail: info@sthamer.com · www.sthamer.com

International Sales Contact
Mr. Jan Knappert
Phone +44 (0) 7795 101770
E-mail: jknappert@sthamer.com





- As the smaller attack lines are typically the first ones deployed on most fires, common belief is that the application of high flows and the use of associated equipment are either unnecessary or unwise. Many times this assumption is correct. Yet, for the small percentage of fires that cause the largest dollar losses, low flowing hand held nozzles are often proven ineffective as the move is inevitably made to defensive operations.
- Improper or inadequate training on this type of initial attack can result in extreme water usage and potential weakening of the fire structure.
- The choice of supply line to a portable monitor will, in some manner, affect its use. Smaller line, limited water delivery but maximum maneuverability, larger line, unlimited flow capabilities, but where it is laid is where it stays.
- And finally, there remains the perception that these devices are strictly for defensive firefighting operations.

The next issue when using a pre-plumbed master stream device is safety. Climbing nearly ten feet up the side of an apparatus, walking across a slippery hose bed, and standing in a storage area with loose equipment is not a great idea even under the best conditions. Add to that cold or freezing temperatures, darkness, and the level of adrenaline the first arriving crew has, and you have a recipe for someone falling from the apparatus and sustaining a career ending injury.

So the next question is how do you follow the recommendations of apparatus manufacturers and keep the firefighter's feet on the ground? This can be simply accomplished by considering remote control operations of the apparatus' fixed monitor. Remote control monitors can quickly provide a heavy attack stream with only the touch of a button. With either radio frequency remote controls, or a panel mounted control station, the operator now can operate the gun remotely taking advantage of the best view of the fire. All of this can be done safely without anyone climbing to the top of

the truck, as well as freeing that firefighter to accomplish other important duties.

The need for higher flows in foam operations is also a consideration when reviewing fire streams management capabilities. Even at the local level, pre-planning for a department's response to a domestic terrorism incident continues to take on importance of dramatic proportions. Certainly, in our free and open society, there is no way that we can identify all aspects or potential threats of a terrorist act, but many of the scenarios rely on a department's ability to provide large, uninterrupted supplies of water or foam for sustained periods of time.

Untold opportunities for potential domestic terrorism, involve flammable or poisonous liquids in both fixed storage and processing facilities, being transported via rail tank cars, in over-the-road tankers, or moving through jurisdictions in underground pipelines. As many fire departments are under-equipped and often inadequately trained to supply sufficient foam firefighting streams, many agencies have chosen the flexibility of having a self-educing foam nozzle that can be used on the deck gun of an apparatus, or portably on a small monitor. Having a simple, reliable delivery system and an adequate supply of foam concentrate can help any department improve their overall response capability to high hazard locations.

Finally, by initiating an aggressive attack utilizing a pre-piped master stream device or a portable pre-connected monitor, you can attack the fire using your total capabilities. As long as the device and stream is carefully and accurately placed and personnel operating the devices are mindful of the method of attack being used, the results will typically be successful. If, on the other hand, all components of your high flow initial attack were initiated properly and the fire still surpassed your ability to suppress it, there was probably little else you could have done.

Remember – Big Fire = BIG WATER

APF

A 33 year member of Cool Spring and Center Township Fire Departments in LaPorte, Indiana, **Rod Carringer** performs research and development, training and active firefighting duties daily. His experience in suppression activities allows him to serve as a State of Indiana Instructor, and as co-founder of the Duneland Fire School in Northwest Indiana.

Foam Concentrates and Foam Systems for all applications



rescue ('reskju:) vb. -cues, -cuing, -cued, (tr.) 1. to bring (someone or something) out of danger, attack, harm, etc.; deliver or save.

Before saving others, you must protect yourself.

Introducing SE40, the world's first positive-pressure breath-responsive respirator, approved according to the new NIOSH CBRN-PAPR standard.

This means exceptional protection and easy breathing even at hard work.

The SE40 works on the demand principle, just like a breathing apparatus: it opens the air flow during inhalation, and blocks it during exhalation. Among other advantages, this means a considerably longer filter life.

The SE40 CBRN respirator has been tested for a wide variety of warfare agents, and is exclusively designed for emergency response.

Wherever your job takes you, SE40 comes to the rescue.



All-in-one stackable kit bag,
always at the ready



theseagroup.com

BUY A PRODUCT. GET A SYSTEM.

Safety Equipment Australia Pty Ltd
35/1 Jubilee Avenue, Warriewood
NSW 2102 AUSTRALIA

Tel.: +61 2 9910 7500

Fax: +61 2 9979 5364

sea.australia@theseagroup.com





The ins and outs of breathing

By The S.E.A. Group

Fire-fighters, rescue workers and other emergency personnel all have one thing in common: their work would be impossible without effective respiratory protection. Breathing is something we take for granted – but there are many facets and complexities to keeping our lungs safe.

Imagine working in a factory where the atmosphere is either dangerous or uncomfortable to breathe. The air might contain hazardous chemicals, or coarse dust that makes you cough, or perhaps highly offensive smells. The ideal solution is, of course, to replace the hazardous material with a harmless one. Failing that, the problem can be 'engineered out', perhaps with the help of fans, exhausts and ventilation systems.

The emergency responder's workplace is different in that there is no way of controlling the air quality. Yet, the atmosphere can be even more dangerous, especially if it is oxygen-deficient, immediately dangerous to life and health (IDLH) or if it contains unknown contaminants in unknown concentrations. So what is the solution? Personal breathing protection. Bring clean air with you, or it might be possible to filter the contaminated air before you breathe it.

Not so clear-cut

The almost automatic choice for fire-fighters and similar professionals is to use self-contained

breathing apparatus, or SCBA for short. Simply carry safe air in a bottle on your back. What could be more practical? But the real-life limitations of SCBA soon become evident.

Operation time is perhaps the most obvious restriction. You have only a certain period of time – often no longer than half an hour – before you must return to safety and replace the air cylinders. But that's not all: you consume your bottled air while making your way to and from the hazard zone, leaving even less time to actually perform the task at hand.

For example, fire-fighters using SCBA while climbing fire stairs know how easy it is to use up a lot of air just getting to a burning floor, leaving less time for work. For the first responders on the scene of the Twin Towers disaster in New York, breathing apparatus was the only option. Then, having established that the air was filterable and not oxygen-deficient, they tried to wear filter respirators.

But there are many downsides of using a filter respirator. Breathing resistance is one. While the

RESPIRATORS

An SCBA-set is not always the only option for all people in all situations



filter itself might give you safe air, just breathing through the respirator can add so much physical workload that it becomes difficult to move, work and breathe. Sometimes people sacrifice protection and simply remove the respirator.

This, too, happened at the World Trade Center incident. Fire-fighters and rescue personnel found it next to impossible to work with their masks on: they had to remove their respirators, putting themselves at risk from smoke and chemical fumes caused by burning or smouldering materials.

Another type of respirator might be a feasible solution: fan-powered positive-pressure demand devices that deliver cleaned air without the time constraints of breathing apparatus, or the physical work of breathing through filter respirators.

Positive pressure is the first key word here. This means that the respirator delivers clean air at such a rate that the air pressure is always higher inside the mask than outside. Consequently, no contaminated air can leak into the respirator. *Demand* is the second key word. A demand respirator delivers air only when the wearer breathes in, thus extending wear time (often to several hours' operation) and saving on filters.

Stress: a vicious circle

Fire-fighting, rescue and emergency response are stressful jobs even without the constricts of breathing protection. Both physical and mental stress is ever-present.

Add to this the need to put a respirator on your face, and stress levels inevitably rise.

The very act of placing something over your nose and mouth can cause mental distress in the form of anxiety or claustrophobia. Even if you experience no discomfort, the body's natural reaction is often shallower breathing at a greater rate. This is a less effective way of breathing which 'wastes' more air and, in the case of SCBA equipment, shortens the operation time of the cylinder. In the case of negative-pressure filter respirators, short fast breaths cause more re-inhalation of spent air in the dead-space of the mask, which in turn contributes to even more shallow and more rapid breathing. The result is a vicious circle that could result in less oxygen uptake at best, and sheer panic at worst.

Emergency responders wearing any kind of breathing protection are often trained to find the willpower to take deeper, slower breaths – even though their body tells them otherwise.

Heat stress is another consideration that needs to be addressed. Not only fire-fighters face this problem, but also workers in foundries, forges, smelters and countless other hot workplaces. In addition, many of these professions also entail wearing thick and heavy protective clothing.

Heat affects your breathing. It also affects your use of breathing protection equipment. Apart from increasing the heart rate and making you pant for air, heat also causes a number of secondary problems, such as perspiration making it difficult to keep the mask securely on your face, and discomfort due to deficient ventilation and poor evaporation.

A ventilated protective suit might alleviate at least some of the problem.

This might be a feasible solution if using a fan-powered respirator, but when it comes to SCBA sets, the amount of air used for ventilation instead of breathing might be of some significance.

That elusive WOB

It is known as *work of breathing*, or WOB for short. It simply means the effort to breathe. Even without any respiratory device, or any other extra loads, a person – even at complete rest – has to perform physical work in order to breathe. Many muscles are used in a single breath.

From this follows that the work of breathing



has great influence on the person's ability to perform a physical job, and conversely, the type and design of a respirator have great influence on the work of breathing. It could be said that 'WOB and JOB' are in constant conflict.

Without getting too technical, work of breathing has to do with a few simple factors no matter what type of respirator is used:

The diameter and number of hoses, inhalation and exhalation valves, and so on. When, say, a fire-fighter is climbing a ladder or carrying a heavy load over a distance, the body begins to need more and more air. If this air is supplied through any kind of respirator, the hoses and valves can become bottlenecks, and might not allow enough air to flow through. The result is that the work of breathing peaks rapidly, and the person either has to stop working so hard, or will put such strain on the respirator that it might affect the face seal of the mask or cause other problems.

The amount of air supplied. In many world standards, breathing apparatus are tested at a peak inhalation air flow (PIAF) of 315 litres per minute. But what happens if you need more air than that? Breathing faster than the SCBA-set's capacity to deliver has the result is the same as with too narrow hoses and valves. (It should be noted that fire-fighters have been measured to breathe at peak air flows between 400 and 500 litres per minute during hard work. Olympic rowers reach over 600 l/min at their maximum exertion.)

In negative-pressure filter respirators, the pressure-fall across the filter. In other words, the type, depth, and diameter of a filter. The work of breathing is directly governed by the breathing resistance of the respirator (both inhalation and exhalation resistance). Result? The same again: stop working, or as mentioned, put undue strain on the protective device.

Fan-powered respirators also need to supply enough air – at least 400 litres/minute. Most conventional powered air-purifying respirators (PAPR) supply only around 200 litres, whereas more innovative designs have no trouble delivering 400 l/min and beyond.

Decon: last but not least

Often forgotten, or treated as an afterthought, is decontamination of respiratory protection equipment.

Everything is done to protect emergency response personnel from the contaminated surroundings: respirators, protective suits, sealed gloves and boots – all are there to shield the body from the environment.

But the protective clothing and devices themselves are constantly exposed to harmful smoke, spray, chemicals, biological materials and more. Needless to say, these substances often 'stick' to the personal protection equipment.

With 100% effective protection, your skin, eyes, lungs, entire body will be completely shielded from the hazards – as long as you are wearing the equipment.

It is when *you take it off* that the greatest risk of exposure occurs.

This is why decontamination prior to removing the protective gear is of utmost importance if the contaminants are detrimental to human health. Removing contaminated clothing and footwear with your bare hands could transmit dangerous



Heavy-duty decontamination of a suit and respirator. This unit uses 1,000 litres of water per minute

substances through skin contact. Taking off your face mask in the safe zone could raise enough dust to be inhaled into your lungs. The risk of exposure is extended to any other person helping you get out of your protective clothing.

In short, all exposed areas of all personal protection equipment, tools and suchlike, must be decontaminated before removal and/or disposal.

Decontamination can be as easy as a quick shower with a simple hose or, in some cases, a big operation comprising heavy equipment using thousands of litres of water and serious containment and collection methods (see picture).

In any event, the respirator and other personal protection must be able to withstand the required decontamination procedure without putting the wearer at risk, or ruining the equipment.

In conclusion

Selecting a respirator for use in fire-fighting, rescue and other emergency operations is not a cut-and-dried decision, and an SCBA-set is not always the only option for all people in all situations.

Several factors cannot be ignored in the selection of respiratory protection for emergency responders:

- Human breathing physiology. How hard does the wearer work? How much air is needed to perform the task?
- Type of job. How long have you got? How far away is the work site? How dangerous is the environment?
- Type of protective device. Can the equipment cope? Is it 'fit for purpose'? Is it approved for the type of hazard? Can it deliver enough air over enough time? Can it handle the workload, or is it at risk of being 'out-breathed'? Will it withstand necessary decontamination procedures?

These and many other questions should be answered before selecting a suitable respiratory protection system for people in the field.

APF

The core information for this article was obtained from The S.E.A. Group in Sydney, Australia. For full details on respiratory protection for emergency responders, body protection, decontamination and more, please visit www.theseagroup.com

Giving you more reasons to choose Fike Alarm Systems.

NEW Integrated Voice Evacuation



Smoke Control



Intelligent Fire Alarm Panels



Graphic Event Management



Video Flame, Smoke and Intrusion Detection



We listen and deliver.

For years, Fike has provided reliable fire alarm systems and excellent customer service. But customers told us they wanted a broader Fike system to meet the needs of different applications. We listened, and we've responded. We now offer a more complete line of advanced fire alarm products including Integrated Voice Evacuation and Video Smoke Detection.

Take a new look at Fike technology. There's a lot to see.

Dependable, Scalable Fire Alarm Protection

Advanced technology. Outstanding customer support. Trusted worldwide.

Fike[®]

ALARM SYSTEMS

WWW.FIKE.COM

1-866-758-6004



The advance of Video Image Detection

Video image detection (VID) has progressed tremendously over the last ten years. The technology has evolved from a concept to a prototype implemented by a few progressive early adopters, to a refined, listed and code-recognized product with applications ranging from cultural properties to nuclear power plants. The speed of the technology's progress and acceptance has benefitted from its use of video and computer components widely used in other industries, such as imagers and processing chips used in high end CCTV security cameras and HDTVs. This article will review the history of the technology's progression and the evolution of the VID industry.

James "Andy" Lynch

Technical Services
Manager, Fike Video
Image Detection

A recent 2010 NFPA Suppression and Detection (SUPDET) conference presentation given by Bob Elliott, a senior engineering specialist at FM Global, identified the 4 stages of VID historical development. The presentation was entitled "Video Image Detection, No Longer a Supplemental System". The four stages are identified as:

- Stage 1** – Flame only
- Stage 2** – Smoke only
- Stage 3** – Combination Flame and Smoke
- Stage 4** – Single Package Combination Flame and Smoke

These stages identify the evolution of the technology, but what can be overlooked is why it has progressed in this fashion. Stage 1 to this day competes with the traditional UV and IR optical flame detectors (OFD). Rather than using a UV or IR sensor, the Stage 1 VID flame detector uses a CCD imager, the visual spectrum, and pixel analysis to identify a flaming fire. The unit itself looks, feels, and provides alarm contacts like any other OFD but also provides a video signal. The units are

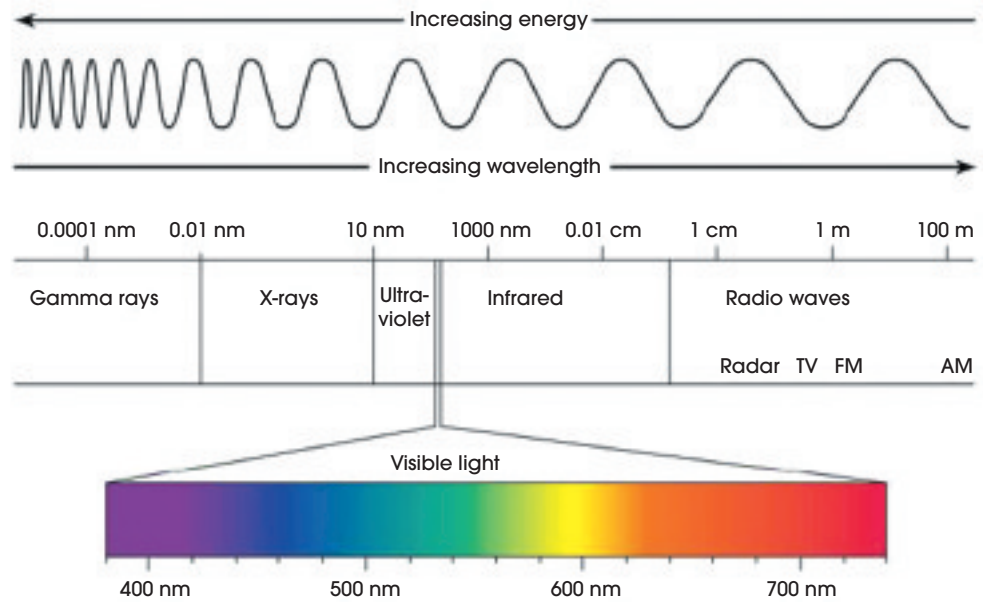
therefore treated as OFDs with approval and installation occurring with little or no change to the standards and fire code.

The next stage was the development of the video image smoke detector (VISD). These systems are server based in that they receive analog video through a BNC camera connection and then process the video feeds on the server. This provides an alarm in the form of dry contacts located on the server. These systems generally handle 4 to 8 cameras at a time. At the time of the inception, these systems were not recognized by code. However, due to the supplemental use in the field FM took the initiative and began to test and approve these systems, setting expectations for a properly installed VID system.

The benefits of this technology were quickly recognized by early adopters. The detectors can identify smoke in large volume spaces (even if stratification took place), provide video for situational awareness, and provide large coverage areas with minimal and easily accessible camera locations. However, these systems also have several

VIDEO DETECTION

Fig 1 – Image of the electromagnetic spectrum that includes Ultra-violet (UV), Visible light, and Infrared (IR) spectrums all used in the fire protection industry for the purpose of detection



drawbacks. The combination of the server and cameras makes for a bulky, power hungry detector. A typical camera consumes 5 Watts of power, while the servers can consume another 200 W. This requires tremendous amounts of battery power to provide an uninterrupted power supply (UPS). Each camera also needs a dedicated continuous Siamese coax and power line between the detector and the server, increasing installation costs.

Stage 3 combined the two algorithms (fire and smoke) into one server based system that can then be tested as a flame and smoke detection device. As supplemental installations continued and the NFPA revision cycle for the 2007 NFPA 72 code came around, it was advantageous to provide guidance in the code for future installations. The code insured a minimum set of requirements be fulfilled. One such requirement is that only listed systems be installed. At the time only Factory Mutual approved video image detection systems by using modified ANSI 268 and FM 3260 standards. NFPA 72 also required an uninterrupted power supply. For the server based systems of the time, this required a large amount of batteries to meet the necessary 24 hours of power required by NFPA. Communication integrity was required, so the systems had to monitor their camera feeds for the interruption and ensure an alarm signal reached the monitoring point. NFPA also requires these systems use a performance-based design. Because of the wide range of performance, architecture, and lighting requirements between each system they will most likely remain performance based within the code. With the introduction of the technology into the NFPA code and FM's ability to approve systems, supplemental installations continued. Due to the cost, privacy issues, and the technology's ability to cover large volume spaces, VID systems (both smoke only and fire & smoke) are generally installed in only non-residential applications such as power plants, warehouses, and manufacturing facilities.

Stage 4 is the most significant stage to date as it combines the two algorithms into a single self contained device. This advance was possible due to increases in computational power over time and advances in the video security industry, especially

the migration toward IP based systems. This stage put the analytics at the edge of the network, providing a more reliable system. It also enabled LED indicators and contacts to move to the device location – a configuration more similar to conventional detection devices. With the contacts on the device the communication loop is direct to the Fire Alarm Control Panel and therefore the communication integrity does not have to take into account the sometimes numerous and long runs of coax from the cameras to the server. And because the device can sit directly on the FACP loop, the NFPA code mandated UPS only has to ensure the cameras (~5 W) stay active rather than the cameras and servers (~200 W) for 24 hours.

Until this stage UL had not listed any VID devices nor did a UL standard exist that VID systems could pass. One hurdle was UL 268, which has been used to test beam, spot and air aspiration systems, required detection within a predefined obscuration limit. The conventional technologies being tested relied on the smoke reaching the sensor, therefore an obscuration measurement can be made at the location of the detector or sampling port to ensure detection within the bounding limits. Video "sees" the smoke – in many instances before it has reaches the obscuration measuring point in the UL268 room. In other words, tying the pass/fail criteria to a point measurement was inappropriate for the 3 dimensional VID detectors. UL has since created UL268B which uses the same test sources and room dimensions but removes the criteria that ties obscuration to the detection, and instead uses a time to detection. FM, which has traditionally tested the systems to modified ANSI/UL 268 and FM 3260 test standards, has begun the process of creating a new Video Image Detection standard (FM3232). This standard will better define the expectations of a VID detector and take into account the advances in the technology, as well as the knowledge gained by FM, manufacturers, and industry personnel.

Currently VID systems that are being installed to code take advantage of the new IP camera system flexibility. The cameras are placed in fixed positions and attached to a 12-24 VDC power supply. This

can come from the Fire Alarm Control Panel (FACP) or a listed power supply. The cameras are then monitored by the FACP using dry contacts attached to an addressable module that indicate when the camera is in a trouble or alarm condition. In addition, the cameras are attached to the Local Area Network (LAN) using the RJ45 jack. This can be attached to a Power Over Ethernet (POE) network switch to provide a redundant power source. IP video and alarm information is then transferred over the LAN to a server for recording purposes. This allows the user, whether it is the building manager, owner, distributor, AHJ or fire personnel, access to the archived video and alarms. User interfaces usually allow easy access to this information as well as floor plans with camera locations, and live video. In certain situations, AHJs can approve the replacement of a traditional code mandated alarm system with a VID system. Some installations forgo the code required power from a listed supply and FACP, instead relying on the POE switch with battery backup and user interface monitored at a control room or security desk. This configuration is generally only used for supplemental purposes.

Lighting

Lighting has been an important issue over the life span of video image smoke detection systems.

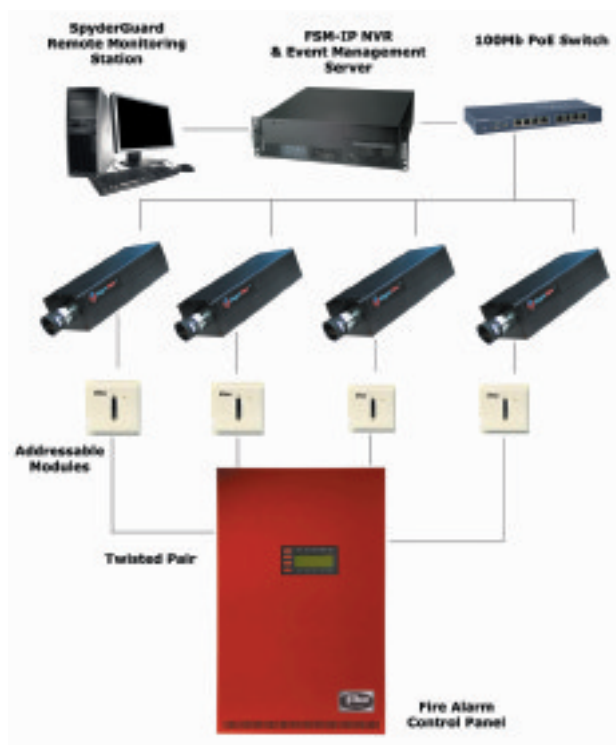


Fig 2 – IP camera system architecture with connection through addressable modules to the FACP and on to a Local Area Network (LAN) for video and alarm storage and viewing

Critics point to the necessary illumination needed to see a smoldering smoke source. Since flaming fires produce light, additional illumination does not need to be supplied for flame detection to occur. However, all video image smoke detection



How warm air can prevent a fire.

The SecuriSens® ADW linear heat detector

Securiton AG, Alarm and Security Systems
www.securiton.com, info@securiton.com
 A company of the Swiss Securitas Group

SECURITON

For your safety

systems need some form of illumination to function correctly, much like how air aspiration systems require a fan to pull the smoke back to the detector. If the fan were to malfunction or the piping became blocked, the smoke would no longer travel through the piping and the smoke would remain undetected. It is for this reason that air sampling systems supervise air flow. In a similar fashion VID systems will fault if the light level gets too low, or if the camera is covered, dirty or out of focus. These conditions need to be supervised.

The supplied illumination can be either Infra Red (IR) or white light depending on the system. Statistics show that a majority of fire incidents reported to the fire department occur at night when a business is closed or has a reduced staff on hand. A challenge to the end user and installer is to provide proper illumination so that the VID system is effective on a 24 hour, 7 days a week, 365 days a year basis.

There are advantages and disadvantages with each illumination type (IR and White Light). A foot-candle (FC) is the English measure for light intensity. Lux is the metric equivalent with 1 FC = 10.76 Lux. Both are measurements of illumination produced by one candela or lumen over one square foot or meter respectively. As Lux and FC are measurements of visible light, and by definition IR produces invisible light, how do you measure the appropriate IR illumination level? In order to measure light radiation in terms of Watts it is necessary to use a radiometer which typically exist only in laboratories and are usually priced beyond the means of normal installation companies. On the other hand, white light is easily measured with a calibrated light meter.

There are advantages and disadvantages with each illumination type (IR and White Light). A foot-candle (FC) is the English measure for light intensity. Lux is the metric equivalent with 1 FC = 10.76 Lux

White light illumination provides color images whereas IR can only deliver a black and white image. This is due to the fact that IR illumination is light which the human eye cannot see but that a monochrome CCTV camera can. In addition, switching between IR at night and white light during the day can result in a focus shift. The different wavelengths create different focus points through the lens onto the camera chip. This can lead to a loss of image focus in dark conditions, particularly if the camera is set up during day time operation. IR light used in CCTV applications is in the 700 to 1,100 nm range – just beyond the visible spectrum, Fig. 1. As white light is visible to the human eye we have natural protection against an over-exposure to white light. On the other hand because humans cannot see IR light our eyes cannot automatically adjust to overexposure and potential eye damage. Applications that require covert surveillance or where no light is allowed

due to light pollution on light sensitive materials, are ideal for IR. However the majority of installations are better served using white light illumination as it provides a higher level of safety and security. In addition, system performance is not changed and light levels can be as low as 1 ft-candle, the emergency light level set by NFPA standards.

VID systems without IR filters can also be blinded by large fires in the field of view. These fires produce a large amount of IR that can flood the imager, creating a blinding affect. The camera may generate a fault condition, but it will also miss the fire source. IR filters prevent this but also make it impossible to use IR illumination for smoke detection.

Using white light provides more options to the end user because it can be supplied by a number of sources including incandescent, fluorescent, High Intensity Discharge (HID), or LED lamps. LEDs are the fastest growing lighting solution for VID applications. They are extremely efficient and offer tremendous reliability. LEDs may cost more initially, but they offer the lowest possible running cost (lower wattages) with longer operating life (up to 10 years).

Some VID systems have built in illuminators attached to the camera. In many cases, a single source will not provide the necessary and proper lighting for a facility and may be unnecessary. In addition, a single high powered light creates large pockets of light with dark areas in the image. Lighting should be placed to provide uniform illumination within the cameras field of view.

Another advantage of white light illumination is that many facilities already have the required 1 FC of illumination. The life safety code (NFPA 101) Section 7.9.2 describes the required emergency lighting levels for safe egress in case of loss of power during an evacuation. The code states that “emergency illumination shall be provided for not less than 1.5 hours in the event of failure of normal lighting. Emergency lighting facilities shall be arranged to provide initial illumination that is not less than an average of 1 FC (10 lux) and, at any point, not less than 0.1 FC (1 lux), measured along the path of egress at floor level. Illumination levels shall be permitted to decline to no less than an average of 0.6 FC (6 lux) and, at any point, no less than 0.06 FC (0.6 lux) at the end of the 1.5 hours. A maximum to minimum illumination uniformity ratio of 40 to 1 shall not be exceeded.”

No matter which video system is installed or its purpose, proper camera placement and illumination is vital. Video image smoke and fire systems rely on proper illumination that generates uniform and adequate levels of light.

Video image smoke and fire detection has evolved a long way in a relatively short period of time, and will continue to do so. Higher processing speeds, increase storage, mega pixel imagers, and advanced analytic capabilities are already being considered for future development and inclusion. The increased use of networks and the impending demise of the Plain Old Telephone Service (POTS) will allow for greater access to information provided by fire alarm and suppression systems. It is necessary that the fire codes, listing agencies, and customers embrace and define the use of new fire equipment and technologies in order to support the changing fire industry.

APF

James Lynch has been employed by Fike Video Image Detection since December 2005, and has served as the manager of technical services. As the manager of technical services he is responsible for fire related research, the development of Video Image Detection (VID) technologies, approvals testing, certification training and VID system implementation. He is a member of the Salamander Honorary Fire Protection Engineering Society, the National Fire Protection Association, the Society of Fire Protection Engineers, and the International Association Fire Safety Science. Mr. Lynch's educational background includes: a B.S. in mechanical engineering and an M.S. degree in fire protection engineering from WPI.

ONLY FIRETRACE IS FIRETRACE

OTHER TUBE-BASED SYSTEMS
CLAIM TO BE LIKE FIRETRACE.
THEY ARE NOT.

- + Only FIRETRACE INTERNATIONAL Systems offer the extensively tested Firetrace brand solutions with listings and approvals[†] from CE, FM, UL, ULC and more than 25 other international agencies on agents such as Dupont FM-200, 3M Novec 1230, CO₂, and ABC dry chemical.[†]
- + Only FIRETRACE INTERNATIONAL has 20 years of experience with more than 65,000 systems protecting equipment worldwide.
- + Only Genuine FIRETRACE SYSTEMS have the tested and proven reliability you and your customers require.

Never compromise your reputation by using impostor, untested and unapproved systems – be sure you are using genuine Firetrace.

FIRETRACE®
AUTOMATIC FIRE SUPPRESSION SYSTEMS

Call +44 (0) 1293 780390 (Europe, Middle East, Africa) or
+1 480 607 1218 (US and elsewhere) or e-mail info@firetrace.com
to see why Firetrace is the right solution for your fire protection needs.

www.firetrace.com
www.firetrace.eu



Firetrace® is a registered trademark of Firetrace USA, LLC / Firetrace Ltd. All unauthorized uses of the Firetrace trademark shall be prosecuted to the fullest extent permitted by the law.

[†] Listings and Approvals vary by system and agent.

**INSIST ON GENUINE
FIRETRACE SYSTEMS
FOR PROVEN FIRE
SUPPRESSION**



Making firefighting **safer!**



PAB Personal Protective Equipment

firefight series

Made of
composite fiberglass

FIRE HT 04 Composite

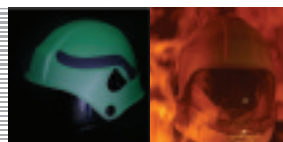
We are introducing the firefighter helmet of tomorrow. It is designed to protect the head in the most extreme conditions. Development and implementation of new composite technology in combination with established design enable full protection even at shorter (flash over flames) temperature exposures, reaching up to 1000 °C. These advantages are rounded up with extreme lightweight (1.200 g) and such design that supports a wide selection of compatible accessories. Structural firefighting has never been safer.



PAB Personal Protective Equipment
Most 26, 52420 Buzet – Croatia

tel: +385 52 662 662
fax: +385 52 662 254

info@pab-buzet.com
www.pab-buzet.com



PAB goes COMPOSITE

Croatian company PAB PERSONAL PROTECTIVE EQUIPMENT, a player in the industry since 1956, has newly engineered a leading edge, professional fire helmet of tomorrow. Together with its composite technology, unique innovative development, and highest level manufacturing standards, the company has reached a new milestone in protective equipment for professional use by fire fighters. The unprecedented helmet characteristics reveal the helmet's key advantages.

The helmet is a response to contemporary demand and challenges facing the professional field while using the latest developments in the composite material technology.

PAB has introduced an extremely light-weight protective helmet, weighing revolutionary 1.35kg, including visor face shield and neck protector. Moreover, the helmet has numerous upgrade options, offering full head protection in extreme temperature conditions. **PAB FIRE 04 HT COMPOSITE**, as opposed to standard helmets in the market, endures temperatures as high as 1000°C.

New technology

Such high level of endurance is achieved through newly introduced and developed technology for manufacturing outer shell from composite materials. Further to its extreme temperature properties, such helmet is lighter and more resistant to mechanical impacts than any standard helmet.

Full head protection

The helmet includes a flip down face visor enabling full face protection against high temperatures, mechanical impacts or drizzling of liquids. Additional neck protection is possible by a removable aluminised carbon-fibre neck protector. Helmet is ready to use with a mask, either by exterior or interior fastening.

Within the shell is a shock absorber made of polyurethane foam. In addition to its regular features, such as amortisation, shock absorber adds a significant impact on insulation characteristics as well. The polyurethane foam padding is covered by a system of straps. The size of the helmet can be instantly adjusted by a spinning-click button, integrated into a basket of supporting stripes. Fastening the helmet is easy thanks to Nomex Chin-strap using quick release snap connection



buckle. Due to its adorable design and extremely facile size adjustment system (ranging for 52 – 62cm), the helmet fits any professional head perfectly. Finally, its interior ventilating channels enable safe and comfortable work.

PAB FIRE 04 HT COMPOSITE is made in conformity with new European standard EN 443/2008 and is currently in the process of being granted an adequate certificate. Its key features include:

- Lightweight of only 1,350 g
- Extreme temperature resistance (up to 1000°C)

– Latest European standards conformity (EN 443/2008)

– Full head protection, including neck and face.

The helmet is available in the following colors:

- red
- yellow-green
- white
- yellow
- photo luminescent yellow-green colours

Other colors may be delivered upon request.

Company PAB was established in 1953 and has over the decades grown into a high tech developer and manufacturer of protective helmets and body safety gear. With its commitment to consistent quality, continuous close relationship with the firefighting professionals, their remarkable talent in engineering, PAB Company has grown to be recognized as a leading edge manufacturer of a reliable body safety gear worldwide.

For more information, please contact:

PAB Akrapovic

Personal Protective Equipment

Most 26, 52420 Buzet – Croatia

Tel: +385 52 662 662

Fax: +385 52 662 254

Email: info@pab-buzet.com

Website: www.pab-buzet.com

MAGMA Helmet – Flexible by Design

Bullard Singapore
Regional Office, Bullard
USA manufacturing

E.D. Bullard (USA) Company, a worldwide leader in security equipment for the fire service, introduces the latest in fire helmet design and technology with its newest model: MAGMA.

Designed with input from firefighters from around the world, MAGMA affords the individual firefighter the flexibility to configure a helmet to his exact requirements. MAGMA is available in two, light-weight, shell configurations: Type A



HELMETS ROUND UP



half shell or Type B, full shell. MAGMA's unique mask adapter design accommodates all of the leading brands of two-point respirator masks and is spacious enough to accommodate spider-style mask harnesses as well. MAGMA also features a three-dimensional visor

that covers the retracted front frame for a maximum degree of visibility in all directions. MAGMA accommodates a variety of communications and lighting accessories.

Beyond flexibility, MAGMA offers firefighters the greatest degree of wearing comfort. The padded head ring is anchored in the rear by the Bullard ratchet-sizing mechanism that provides the wearer the ability to make comfort adjustments at five different points. An X-shaped neck strap and a four-way adjustable chinstrap add further to the firefighter's ability to obtain a comfortable fit.

MAGMA naturally affords the wearer the maximum in performance in the difficult conditions of firefighting. The helmet's inner compartment is well protected from the heat, flames, sparks and fluids that are part of daily firefighting activities. Designed to the require-

ments of EN443:2008, firefighters can have confidence in the MAGMA helmet.

MAGMA's design flexibility does not translate into complexity. On the contrary, MAGMA was designed with the fewest number of components of any helmet available today. This means ease of disassembly and maintenance and a much lower total cost of ownership over the life of the helmet.

MAGMA is scheduled for release during the second quarter 2010 and will be available from authorized Bullard dealers around the world.

For more information, please contact:
Bullard Asia Pacific
701 Sims Drive, #04-03
Singapore 387383
Tel: +65-6745-0556
Fax: +65-6745-5176
Email: bullardasia@bullard.com
Website: www.bullard.com

Own Helmet Production

A fire helmet is a key component of personal protective equipment. Dräger uses a new production facility to generate momentum here – and to be a trendsetter.

Dräger? Respiratory protection! That's the answer firefighters immediately give when they are asked about products made by the Lübeck-based company. Dräger usually isn't associated with fire helmets, even though the company has developed models such as the HPS 4300 and the HPS 6200. So far these were produced by a supplier, but since 2009 they are being manufactured in a new established joint venture.

The helmet as part of a system

A fire helmet consists of about 80 individual parts, and the vertical range of manufacture currently extends down to the smallest detail. The synthetic material *Nomex* is purchased from outside for the helmets, but the stitching it requires – for production of the helmet liners, for example – is handled by Dräger. "The customer expects that a helmet with the name Dräger on the outside will also be Dräger on the inside," says Markus Lamm, Portfolio Manager for Head Protection at Dräger. With development and

The Dräger helmet



The centerpiece of the Dräger "Head Protection System" (HPS) is a helmet shell of glass-fiber reinforced duroplastics. This exceptionally light combination of materials is extremely resistant to very low and very high temperatures. At shell temperatures between 250 and 270°C (depending on helmet color), Dräger helmets can withstand a five-kilogram ball dropped from a height of 2.5 meters and effectively protect the head against the impact energy. It can also prevent penetration by a one-kilogram pointed object from a height of 2.5 meters.



*(formerly known as
Pacific Helmets Australia)*

Emergency Products for Critical Situations

MAJOR DISTRIBUTOR FOR

- Bristol Fire Clothing • Pacific Helmets NZ • ESKA Gloves
- Hot Stick USA • ESS Goggles • Kappler Chemical Suits
- Aqua Fast Pumps • Argus 4 Thermal Imaging Cameras
 - Eflare Beacons • Lifeline Flash Hoods
- Kestrel Weather Meters • Air Boss Defense Boots
 - UKE Torches and Accessories
- Quick Fist One Piece Clamps • Ventry PPV Fans
- Preco Environment Waste Spill Control Products

PHONE: +61 7 3441 7100

FAX: + 61 7 3441 7177

www.pacfire.com.au • sales@pacfire.com.au

HEAD OFFICE QLD

Unit 1, 28 Burnside Road
Hallmarc Business Park
YATALA QUEENSLAND 4207
AUSTRALIA

HELMETS ROUND UP

production from a single source, new opportunities emerge: "It is now much easier and much less time-consuming to realize an integrated head-protection system in which the helmet, mask, and accessories perfectly complement one another and thus contribute to greater safety," says Lamm. The integration of new functions and sensor technology in the helmet raises new questions, however. "Enhanced sensor technology for monitoring firefighting and rescue operations and improved visualization technologies must be critically evaluated in terms of their usefulness for fire departments," explains Jumpertz, one of two managing directors of the new production site. And in any case, the Dräger Body-Guard II signal and warning unit for compressed-air breathing apparatus already enables firefighters today to not only gauge device data but also measure ambient temperature and telemetrically forward this information to a command center.

There are several versions of the helmet-mask combination available. With the S-Fix system, breathing masks such as the Dräger FPS-7000 are clamped to the

helmet's exterior, which means the mask can be used in combination with helmets from other manufacturers, and vice versa. The HPS 6200 helmet is also available with the alternative Q-Fix system. With this combination, an additional safety button is used to prevent the breathing mask from becoming unclamped as a result of an impact.

Comfort is personal

"Head protection is of the utmost importance to firefighters, but there's no such thing as the perfect helmet," says a veteran of a German Professional Fire Department who was co-responsible for the procurement of protective clothing at a vehicle and equipment service unit. Today his work focuses on emergency vehicles, but as the Respiratory Protection Officer he remains closely involved with the issue. "For interior attack, we use respiratory protection masks with a five-point head harness, a two-ply hood and the helmet. We currently use three different types of masks with various designs. After all, facial shapes differ, so this is the only way we could optimally equip nearly 5,000 firefighters."

Cool heads in Scandinavia

A Scandinavian Professional Fire Department switched to the Dräger HPS 6200 in 2007. "With the previous helmet from another manufacturer, we had problems with heat damage," explains the Chief of the Fire and Rescue Services. The new helmet had to take more punishment: "We tested six different helmets, sending four firefighter instructors wearing the helmets under consideration into our training building, and the Dräger helmet exhibited the best resistance to heat."

For more information, please contact:
Dräger Safety Asia Pte Ltd.
67 Ayer Rajah Crescent #06-03
139950 Singapore
Tel: +65 6 872 9288
Fax: +65 6 512 1908
Website: www.draeger.com

Dräger

New F900 Cromwell Fire Helmet



Following an extensive assessment and evaluation period, helmet manufacturer HELMET INTEGRATED SYSTEMS LTD (HISL) has announced the availability of the Cromwell F900 Fire Fighters Helmet.

Colin Robinson, Sales Manager of Fire Products at HISL commented: "The company has been the UK's leading manufacturer of helmets for more than 80 years. The new Cromwell F900 represents yet another step forward, both for us and the industry, and demonstrates HISL's commitment to improving the fire helmet sector."

This is the latest addition to a growing product range for Company based in Hertfordshire and Scotland.

The new helmet is approved to the latest standards for structural fire helmet protection, (helmet to EN443:2008 and face guard to EN14458:2004). The optically correct high energy impact resistant polyphenylsulfone (PPSU) face guard with anti-abrasion and anti-fog protective coatings is certified to the high energy impact requirement of EN14458:2004 at extremes of temperatures. Furthermore, the modular design includes a detachable face guard cover, which protects the most vulnerable area of the helmet and is easily replaced if damaged, helping



to reduce the life cycle costs and protecting the integrity of the helmet shell.

HISLs Research and Development Project Manager, Martin Gouldthorpe added: "The new helmet provides increased standards of protection and comfort, combined with the advantage of minimising service and repair costs. Its unique internal liner absorbs impact and deflects heat providing an effective insulation barrier."

This is the latest addition to a growing product range for the Company based in Hertfordshire and Scotland, with recent announcements about its police public order helmets obtaining CE accreditation and developments across its range of PAPR and Air Fed respirators for industrial use. The new helmet joins a range of fire helmets offered by the company, including the Cromwell F600 which is certified

to the earlier standards (EN443:1997, EN166:2001) and the USAR, General Rescue and Wild Land Fire solution the Cromwell ER1, which is in operation worldwide.

**For further information please contact
Helmet Integrated Systems on:
Tel: +44 (0) 1776 704421
Fax: +44 (0) 1776 706342
Email: sales@helmets.co.uk
Website: www.helmets.co.uk**



FISF Helmets EN443: 2008

Approved according to European Norm 443:2008, MSA's range of F1SF helmets sets the last standard for firefighter's head protection and comfort.

It fulfills the growing requirements of fire soldiers in their varied tasks and is especially dedicated to structural fire-fighting in buildings, tunnels and other structures with sometimes extreme conditions like for example heat, flames, falling objects, electrical and chemical hazards.

Thanks to its unmatched comfort, its adjustable mask attachment feature and its interfaces for accessories, the F1SF is a true platform for all critical operations where the firefighter needs a maximum of functionality and comfort to fully concentrate on his tasks.

Since its introduction in 1985, MSA Gallet has made several enhancements to the F1 series to continuously ensure superior protection and comfort according to the latest technologies, standards and expectations of the growing number of users.

Here again, the reinforced shock absorption system and the enhanced face shield meeting EN14458 requirements



significantly raise the level of protection against a multitude of hazards. At the same time the F1 keeps its unique prop-

erties and style and remains the reference fire-fighting helmet throughout the world.

The main characteristics of the F1SF are:

- Compact helmet with full coverage (EN 443:2008, Type B), including a selection of high quality neck/integral protection
- Well balanced design and multiple adjustability for long time wearer comfort
- Eye/face protection with 2 retractable visors depending on the application:
 - a metal coated face shield with high optical performance and radiant heat protection
 - an ocular visor with very high mechanical resistance
- Mask helmet combination with optimized fit through adjustable and reliable *KitFix* interface
- Unique possibility to customize the product with coat of arms and colored front plate
- Adjustable 3 point chinstrap with built-in comfort pads

**All helmets are designed and manufactured by MSA in
Châtillon-sur-Chalaronne (France), using high performance materials
and applying most stringent quality standards.**

HELMETS ROUND UP

- Comfort headband with patented quick adjustment system (53-64 cm)
- Built-in interfaces for accessories: choice of lamps and communication headsets
- Wide range of colors available

For larger head sizes (58-65 cm) the F1E model with similar characteristics is available.

All helmets are designed and manufactured by MSA in Châtillon-sur-Chalaronne

(France), using high performance materials and applying most stringent quality standards.

MSA also designs and manufactures a comprehensive range of NFPA 1971:2007 approved helmets, as well as head protection for rescue, police, special forces, military, aeronautics and industrial applications. Further products of MSA's wide range of Personal Protective Equipment

include respiratory protection, thermal imaging cameras, hearing protection as well as gas detection devices.

For more information, please contact:

MSA Gallet

Tel: +33 (0) 474 55 01 55

Fax: +44 (0) 474 55 24 80

Email: message@msa-gallet.fr

Website: msa-gallet.fr

Pacific Helmets (NZ) Ltd.

PACIFIC HELMETS (NZ) LTD showcased several new and innovative helmet designs at the Interschutz show in Germany this June.

Over the years Pacific Helmets has worked closely with emergency services throughout the world to design helmets that meet their exact requirements. This collaboration and our flexible manufacturing process has resulted in Pacific Helmets having the largest range of emergency services helmets of any helmet manufacturer in the world

There have been vast improvements to the Personal Protective Equipment (PPE) used by emergency service personnel, both in the materials used and the design of the equipment.

In addition to meeting the required standard the best protective equipment should fulfil the following requirements:

- Suitable for purpose
- Suitable for the environment in which it is to be used
- Culturally accepted
- Easy to use

Given the large range of equipment that is available to emergency services it is vital that the right PPE is used for the job. The wearer must be suitably protected from the risks they are likely to face. However this must be achieved while still allowing the wearer to carry out the tasks required of them. Many rescue personnel do not require bulky and heavy equipment that impedes their ability to work. Likewise it would be unwise to enter a structural fire wearing only light duty equipment. Pacific Helmets makes a range of helmets for all situations, whether it be confined spaces, bushfires or structural fires. These helmets vary greatly in design depending on their intended purpose.

Helmets should also be suitable for the environment they are to be used in. For example during the prolonged ambient heat experienced during a bush fire, personnel need equipment that will keep



them safe but also be light and cool so to avoid them overheating. Our bodies lose over 60% of body heat through the head; therefore it is important that the helmet allow the necessary heat dissipation from the wearer. Pacific Helmets manufacture a range of vented reuse helmets and lightweight bush fire helmets that allow excellent heat dissipation in hot environments.

**Pacific manufactures
helmets to every
major safety standard
throughout the world.**

By making helmets that are lightweight and comfortable the risk of personnel removing the helmet is greatly reduced. Unfortunately recent trends in international standards such as EN443; 2008 and NFPA 1971 have meant that many helmets manufacturers have needed to add significant weight to structural fire helmets (up to 25%) in order to meet the standards. This increases the likelihood that users will take off their helmets during prolonged use, putting themselves in danger.

Exporting to over 80 countries, Pacific Helmets manufactures helmets to every major safety standard throughout the world.

The style of helmet varies greatly depending on cultural norms. Fire helmets for instance are available in the full Euro style and the traditional or classic style. There are pros and cons for both styles, but both offer excellent protection and much of the argument is largely based cultural norms.

Pacific Helmets manufactures both the Euro style helmets that are used throughout Europe and the Middle East and Asia, and the classic style fire helmet used in Australia. Equipment must be socially acceptable to ensure that personnel have no resistance to wearing them.

Pacific Helmets is continually looking at ways to make our helmets user-friendlier. A result of this is the launch of our new "One Touch" eye protector. This unique system allows the deployment of an internally stowed eye protector with a simple push of a thumb. There is no more fumbling with knobs or tabs while wearing cumbersome or contaminated gloves. This feature is available both in structural fire helmets and Paramedic helmets.

For more information, please contact:

Pacific Helmets (NZ) Ltd

Tel: 64 + 6 + 344 5019

Fax: 64 + 6 + 344 5376

Email: sales@pacifichelmets.com

Website: www.pacifichelmets.com

PARTNERS



CHEMGUARD

THE GLOBAL LEADER IN FLUOROSURFACTANT AND FOAM CONCENTRATE TECHNOLOGY
AND

WILLIAMS FIRE & HAZARD CONTROL

THE GLOBAL LEADER IN FLAMMABLE LIQUID FIRE FIGHTING

Chemguard now manufactures the complete line of Williams ThunderStorm[®] and T-STORM[®] products, including the premiere fire-fighting foam concentrate, F-601B 1x3 AR-AFFF.

www.chemguard.com

www.williamsfire.com



Follow the virtual leaders.

Our airport crash tenders of the series IMPACT and DRAGON are an overall outstanding class "Ground Staff". With highest mobility chassis, powerful high-torque IVECO engines, extinguishing agents of up to 14,000 litres, powerful pumps and monitors as well as aluminium modular body and equipment compartments system you'll drive it sovereign ahead by every call out.

Interested? Then follow us to: **www.iveco-magirus.net**

**IVECO
MAGIRUS**
**IVECO
MAGIRUS**
Camiva

IVECO MAGIRUS
Brandschutztechnik GmbH
D-89079 Ulm
magirus@iveco.com

IVECO MAGIRUS
Brandschutztechnik GmbH
A-8301 Kainbach / Graz
lohr@iveco.com

IVECO S.P.A.
Stabilimento Mezzi Speciali
I-25127 Brescia
ivecomezzispeciali-e@iveco.com

IVECO MAGIRUS
Fire Fighting Camiva
F-73230 Saint-Alban-Laysse
contact@camiva.com





Prepared for the Unavoidable?

During the Nuclear Security Summit in Washington D.C. in April 2010, U.S. President Obama said “The single biggest threat to U.S. Security, short-term, medium-term and long-term, would be the possibility of a terrorist organization obtaining a nuclear weapon. This is something that could change the security landscape in this country and around the world for years to come”.

By Ernst Hepler

Senior Consultant
Blücher GmbH

During this summit, the U.S. government stated that the probability is very high that terrorists will acquire radioactive or biological material until 2013 to build a kind of bomb which could be detonated in a town with millions of inhabitants.

Recently, the British Security Minister Lord West has warned that Britain could be more open to nuclear and chemical attacks by terrorists and that the risk of a dirty bomb blast at the London Olympics in 2012 is a very real danger.

In February 2010, Exercise “Lükex 09/10” took place in Germany, with several federal states participating. The exercise dealt with the handling of a nationwide crisis due to terrorist attacks, including incidents with chemical and radiological weapons.

These statements and those of many other experts, as well as strategies and provisions in many countries worldwide allow anticipating developments towards the most destructive forms of terrorism: the chemical, biological, radiological and nuclear (CBRN) terrorism.



The threat

CBRN terrorism could become reality in three ways. The first and most basic form would be the misuse of existing Weapons of Mass Destruction (WMD). However, the possibility of non-authorised use of military chemical, biological or nuclear weapons is limited, mainly because of their strategic importance and the ongoing implementation of arms control and disarmament agreements. It is hardly conceivable that terrorists, how effectively organised they may be, could lay their hands on military NBC weapons. Consolidated findings, however, indicate that even nuclear terrorism cannot be ruled out.

A second form of threat could come from the manufacture and use of WMD components by terrorists themselves, as happened in 1995 in the Tokyo underground when the Aum sect used Sarin that it had produced. Lethal toxic compounds, highly efficient pathogens and toxins, as well as the misuse of Toxic Industrial Chemicals (TICs), infectious materials and radionuclides, are in the range of possibilities. For some years, hazards from the offensive use of so-called "radiological dispersal devices (RDDs)" or "dirty bombs", have become an important issue. An RDD combines conventional explosives with radioactive material and could potentially contaminate large areas for many years.

The third form, still underestimated today, is when dangerous substances like TICs, inflammable substances, radionuclides or infectious materials are released as a result of attacks on installations such as production facilities, storage sites and laboratories, with conventional weapons. Such attacks, causing the sudden release of harmful substances, would have a much more dramatic effect than those caused by human error or equipment failure.

First responders

Today, most of the First Responders are well-trained and equipped for "conventional" disaster and hazardous material incident response. Gas-tight garments, combined with air supply systems, have been standard for many years. Police Forces in many cases are only equipped with protective masks.

The magnitude of potential events and the need for preparedness warrants that all First Responders be trained and equipped for handling the unique hazards associated with CBRN terrorism.

From the terror attack in Tokyo we have learned that the first hour, often called "golden hour", is the crucial time for saving lives and that organisations are required that can respond within minutes. These local community organisations are fire brigades, police forces and rescue and emergency medical services.

CBRN terrorist incidents are always creating chaotic circumstances. One can imagine situations with multiple casualties, many of them crying for help, suffering from excessive sweating, vomiting, rapid breathing or watering eyes, when the most important factor is time. In order to reach the highest efficiency of rescue teams, protective gear with the optimal compromise between protection for the worst case scenario and functionality with regard to fulfilment of the mission needs to be found.

The responsibilities of First Responder units in a CBRN terrorist incident are different from country to country. For example, within the Israeli Home Front Command, the police force is responsible for the evacuation of non-affected people and victims from the hot zone, controlling the entire operation and isolating the area. Environmental Teams detect and identify the hazardous materials and consult with the operations leader in risk assessment.

Ship Halon Phase Out

Retrofit with Gielle Clean agent fire
suppression systems

- Utilize existing piping
- 1 to 1 cylinder/nozzle replacement
- Existing Halon Systems / Existing HCFCs Systems
- Express service
- Worldwide 24h service
- Full range of International Approvals

GIELLETM
www.giellemarine.com

Imo Halon Banking authorized
FP.1/Circ.37 - Jan 2009



Gielle / info@giellemarine.com



Emergency and first aid medical teams treat and transfer the victims to hospitals. Fire brigades are responsible for the decontamination of contaminated victims and First Responders, coming out of the hot zone.

In Germany, the responsibilities are allocated differently. Here, the fire brigades bear the major burden of reconnaissance and rescue work in the hot zone and the following decontamination tasks. The police forces, which partly have not been adequately equipped and trained yet, are mainly responsible for closing off and securing the entire action.

Equipment

In general, the different technologies of protective equipment for First Responders can be grouped in following 4 categories. As not all potential users are familiar with the U.S. levels A to D of OSHA or classes 2 to 4 of NFPA, this categorisation in accordance with technical aspects was chosen.

Type 1: fully encapsulating gas-tight chemical protective garments with positive air supply or self-contained breathing apparatus.

Type 2: air-impermeable garments made of different specific synthetic materials with full-face air purifying respirators or self-contained breathing apparatus.

Type 3: garments consisting of flame-retardant thermal layers and a layer of an air-tight semi-

permeable or selectively permeable membrane, with full-face air purifying respirators or self-contained breathing apparatus.

Type 4: air-permeable garments with a layer of activated carbon with full-face air purifying respirators.

Type 1 offers the highest possible protection, but it takes a long time for donning and doffing the equipment. It also restricts the mobility of the wearer and can only be used for limited periods of time due to limited air supply and high heat stress. This expensive equipment is therefore not suitable for fast rescue activities and life saving missions. It is appropriate when First Responders can come into contact with bigger splashes of harmful liquids from unknown sources and/or high concentrations of enduring toxic vapours, which can occur in confined spaces, like tunnels or undergrounds. In these cases, an evaluation of the situation, the detection and identification of the hazard and the evacuation of victims from the hot zone, should be conducted by using such equipment.

Type 2 can offer reasonable protection but the protection degrades quite rapidly due to the "bellows effect", i.e. a significant amount of contaminated air is continuously pumped into the garment through unavoidably leaking seals and closures or damaged fabric parts. In addition, dependent on climatic conditions and physical strain, the wearers' performance is likely to degrade rapidly due to heat stress caused by



SARATOGA®
Blücher Technologies

FULL SPECTRUM PROTECTION
WE GO BEYOND

BLÜCHER GmbH
+49 211 9244 0 phone
+49 211 9244 211 fax
info@bluecher.com
www.bluecher.com

BLUECHER UK Ltd.
+44 1507 451 443 phone
+44 1507 451 094 fax
info@bluecheruk.com
www.bluecher.com

BLÜCHER SYSTEMS GmbH
+49 2153 9540 0 phone
+49 2153 9540 70 fax
info@bluechersystems.com
www.bluechersystems.com

BLÜCHER®
Innovation since 1214

prevention of an exchange of heat and sweat occurring from metabolic load.

Type 3 is the preferred garment for fire brigades in fire fighting missions that often also is worn during live saving missions. Similar clothing is also worn by some police forces. The protection level is comparable to that of type 2 garments. As the membrane which is integrated into the textile layers is airtight, the “bellows effect” phenomenon also applies to these garments. The bellows effect can be avoided by adding a layer of activated carbon, which is sometimes the case for police forces. The limited water-vapour permeability of the membrane can cause considerable heat stress, dependent on environmental and working conditions.

Type 4 is the standard military individual CB protective garment. It consists of a textile outer layer that stops liquids, and an inner layer containing activated carbon for the adsorption of hazardous vapours. Permeable-type garments in general provide protection factors in the order of one or two magnitudes higher than type 2 and type 3

Small amounts of contaminated air that could pass through seals and closures are adsorbed by the activated carbon layer from the inside, before they can reach the skin.

garments. Small amounts of contaminated air that could pass through seals and closures are adsorbed by the activated carbon layer from the inside, before they can reach the skin. Due to the high air and water-vapour permeability of the textile layers, the physiological load on the wearer is much lower than for type 2 and type 3 garments.

On-site situation

In many cases, First Responders will arrive on the scene when the initial concentration peak of volatile chemical agents or TICs as well as biological aerosols and radioactive particles have been dispersed, diluted and dissipated into the air considerably. The predominant hazard is against the respiratory tract. For those First Responders that don't have to enter the hot zone, the skin exposure dosages are moderate or low and clearly below the levels that are expected in military conflicts. Good respiratory protection, equal or better than military standards, is required in any situation. Garments similar to the individual CB protective garments of the military are then appropriate.

Solution

First Responders, including police forces, that are responsible for saving lives after CBRN terrorist incidents, need equipment that provides adequate protection, is easy and fast to don and doff and allows to work in dynamic chaotic situations for longer periods of time. In addition to efficient respiratory protection, air-permeable-type suits based on activated carbon adsorption, which also prevent the penetration of aerosols and radioactive particles, are the best possible solution.

Out of the existing adsorptive technologies, i.e. carbon-impregnated foam and nonwoven and activated carbon fibre technology, the spherical adsorber technology has proven to be superior in terms of protection, durability, mechanical stability, wearing comfort, launderability and versatility.

SARATOGA® garments based on the spherical adsorber technology which have been especially developed for First Responders, are presently widely used, as for example by the German Civil Defense Organisation, U.S. City Fire Departments, Federal and State Police Forces, FBI, State and City Emergency Rescue Units and Emergency Response Organisations (“Hammer Suit”), the Royal Canadian Mounted Police, the Singapore and Saudi Arabian Civil Defense Forces and the Italian Carabinieri.

CB protective gloves, socks or boots as replacements for heavy and bulky rubber articles complement the range of SARATOGA® applications.

APF

FIGHT FIRE WITH FIRE

Simulation provide customised hot fire training simulators (static and transportable), designed to meet the needs of many different sectors including:

Civil Airports	Maritime	Local Authority	Military
Industrial	Training Schools	Offshore Oil & Gas	Mobile

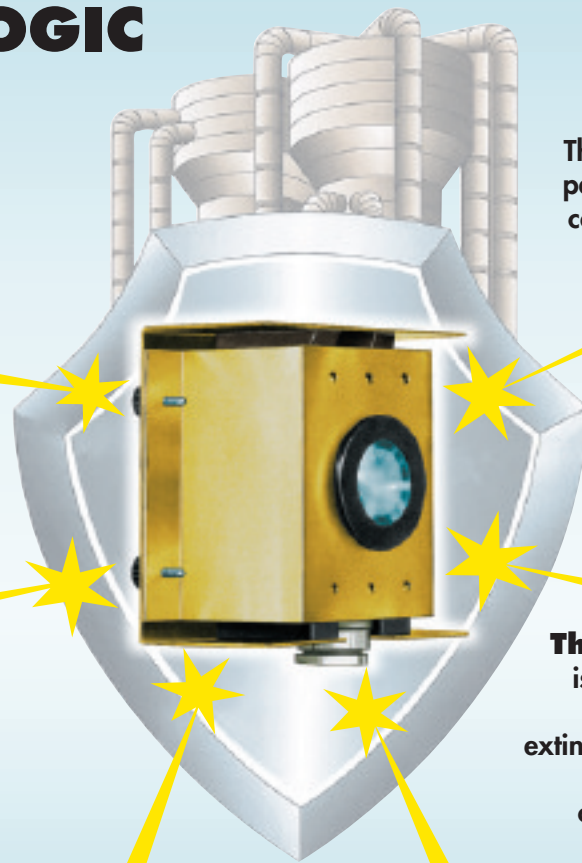
Our highly personal approach has seen us become a simulator supplier for so many organisations, to find out how we can help you contact us on: +44 (0)1283 213395 or email info@simulation.uk.com

www.simulation.uk.com

Simulation

CONTROL LOGIC Spark detector

designed for
dust collection
systems
to protect
storage silos
from the risk
of fire.



**Sparks fly
at high speed.**

They travel at a hundred kilometres per hour along the ducts of the dust collection system and reach the silo in less than three seconds

The CONTROL LOGIC SPARK DETECTOR

is faster than
the sparks themselves.
It detects them with its highly
sensitive infrared sensor,
intercepts and extinguishes
them in a flash.
It needs no periodic inspection.

The **CONTROL LOGIC system**
is designed for "total supervision".
It verifies that sparks have been
extinguished, gives prompt warning of
any malfunction and, if needed,
cuts off the duct and stops the fan.

ISO 9001

20137 Milano - Via Ennio, 25 - Italy
Tel.: + 39 02 5410 0818 - Fax + 39 02 5410 0764
E-mail: controllogic@controllogic.it - Web: www.controllogic.it



CONTROL LOGIC s.r.l.



**IR FLAME DETECTOR
RIV-601/FA
EXPLOSIONPROOF
ENCLOSURE**

For industrial applications indoors
or outdoors where is a risk of explosion
and where the explosionproof
protection is required.
One detector can monitor a vast area
and responds immediately
to the fire, yet of small size.

BETTER TO KNOW IT BEFORE

Eye is faster than nose.

In the event of live fire
the IR FLAME DETECTOR
responds immediately

CONTROL LOGIC IR FLAME DETECTOR

the fastest and most effective fire alarm device
for industrial applications

Also for

RS485 two-wire serial line



**IR FLAME DETECTOR
RIV-601/F
WATERTIGHT
IP 65 ENCLOSURE**

For industrial applications indoors
or outdoors where fire can spread
out rapidly due to the presence of
highly inflammable materials,
and where vast premises need an optical
detector with a great sensitivity
and large field of view.

ISO 9001

20137 Milano - Via Ennio, 25 - Italy
Tel.: + 39 02 5410 0818 - Fax + 39 02 5410 0764
E-mail: controllogic@controllogic.it - Web: www.controllogic.it



CONTROL LOGIC s.r.l.

Figure 1. Training Transfer to Operational Incidents



Live Fire Training as Simulation

By Edward E. Hartin, MS, EFO, MIFireE, CFO

Fighting fires inside buildings (compartment fires) is a low frequency/high hazard activity for firefighters around the world. Effective training develops the knowledge to make appropriate strategic and tactical decisions as well as proficiency in the skills necessary to mitigate or reduce hazards and provide a safer operating environment. However, the question of what makes fire training effective is often unasked and even more often unanswered.

Understanding and application

Safe and effective structural firefighting operations require a solid understanding of fire dynamics and skill in task and tactical activity. However, while necessary, this knowledge and skill is not sufficient. Firefighters and fire officers must effectively apply this knowledge on the fireground. Facilitating this transfer from training to operational context is a significant challenge.

It is reasonable to expect that firefighters and fire officers develop critical skills before being called upon to use them under emergency conditions. However, as Aristotle observed; “for the things we have to learn before we can do, we learn by doing” (Aristotle, 1984, p. 1738). Training in a realistic context not only provides an opportunity to develop a practical understanding of fire dynamics and proficiency in firefighting skills, but is also a means for learners to recognize cues and conditions that are critical to effective decision-making.

In emergency operations, firefighters are often faced with limited information about the building, occupants, contents, and fire conditions. This lack of information increases firefighters’ risk. However, in the training environment, conditions are controlled to provide a safer environment for the participants. Speaking at the 2009 International Fire Instructors Workshop in Sydney, Australia Dr. Stefan Svensson of the Swedish Civil Contingencies Agency posed the question: “How do we get learners to understand the differences between training fires and ‘real fires’?”. This is an interesting

question in that training conducted in a container, burn building, or acquired structure is in fact a “real fire”, but has considerably different characteristics than a fire occurring in a house, apartment, or commercial building. Improperly designed training may provide the learner with an inaccurate perspective on the fire environment which can lead to disastrous consequences.

Recognizing the differences between the training and operational environment is critical to learners, trainers, and training program managers. Training must not present unreasonable risk to the participants, but must result in development of knowledge and skill that effectively transfers to the operational environment.

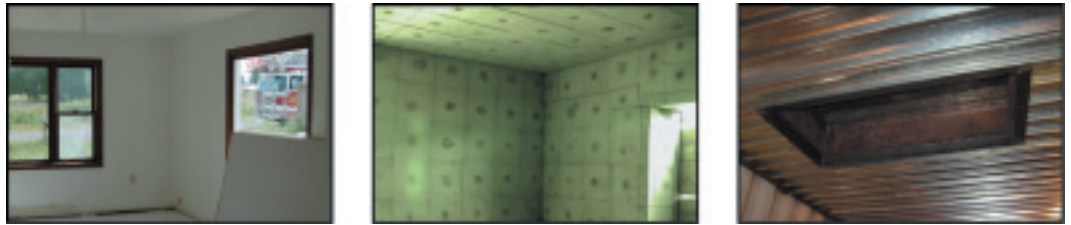
What is the difference?

Compartment fires in the training environment differ from those encountered during emergency operations on the basis of compartment characteristics, fuel, ventilation profile, heat release rate, and time scale. In addition to differences related to fire dynamics, firefighters and fire officers also encounter psychological stress resulting from a sense of urgency and societal expectations of immediate action (particularly in situations where persons are reported to be trapped in the building).

Other than acquired buildings, structures used for fire training are generally designed and built for repetitive use and not for regular human habitation. Structural characteristics that make a durable live fire training facility are considerably

TRAINING SIMULATION

Figure 2. Variations in Structural Characteristics Influence Fire Behavior



Note: From left to right, these photos illustrate an acquired structure with gypsum board compartment linings, a purpose built masonry burn building with high temperature ceramic lining, and steel container based prop with corrugated sheet steel lining.

different than most if not all other structures in the built environment. Density, thermal conductivity, and specific heat of training structures can be considerably different than a dwelling or commercial structure, which has a significant impact on fire behavior.

A purpose built prop or burn building is also likely to have significantly different compartmentation and ventilation profile than a typical residential or commercial structure. Live fire training facilities often (but not always) are designed with small burn compartments. This speeds fire development and minimizes both initial and ongoing cost. However, fire behavior and the impact of fire

durable (e.g., metal) windows do not present the same potential for failure.

While structural characteristics, compartmentation, and ventilation differ between typical structures in the built environment and those used for live fire training, one of the most significant differences lies in the types, quantity, and configuration of fuel.

Occupational safety and environmental considerations are the two major influences on the type and amount of fuel used for compartment fire behavior training (CFBT).¹ In the United States, the impact of environmental regulations on live fire training varies with location. In general, requirements related to emission of smoke are

Other than acquired buildings, structures used for fire training are generally designed and built for repetitive use and not for regular human habitation. Structural characteristics that make a durable live fire training facility are considerably different than most if not all other structures in the built environment. Density, thermal conductivity, and specific heat of training structures can be considerably different than a dwelling or commercial structure, which has a significant impact on fire behavior.

control tactics can be considerably different in a large area and/or high ceiling compartment. Many modern structures are designed with open floor plans that are challenging to duplicate in the training environment. Energy efficient structures limit ventilation (air exchange), while training structures are often quite leaky, particularly after extensive use. This can have a significant influence on development of a ventilation controlled burning regime and influence of ventilation on the concentration of gas phase fuel in smoke. Failure of glass windows in ordinary structures should be anticipated, as this changes the ventilation profile and resulting fire behavior. Training structures on the other hand provide a more consistent ventilation profile as

more stringent in urban areas. National Fire Protection Association (NFPA) 1403 Standard on Live Fire Training (NFPA, 2007) is fairly explicit regarding fuel characteristics and loading for live fire training evolutions, prohibiting the use of treated wood, plastic, rubber, and flammable liquids (unless a purpose built prop is specifically designed for use of liquid fuel). Fuel loading must also be limited to preclude the occurrence of uncontrolled flashover or backdraft. Fuel used for CFBT generally falls

¹CFBT is used here as a generic term for training in practical fire dynamics and compartment firefighting and is inclusive of classroom instruction, laboratory demonstrations, live fire training in fire behaviour, and live fire tactical training.

into two categories, Class A fuels such as wood or straw and Class B gas fuels such as propane.

Differences in structural characteristics, ventilation profile, and fuel load provide considerably different fire dynamics between the training and operational environments. How much and in what ways does this impact on the effectiveness of training in compartment firefighting?

Fidelity

CFBT does not completely replicate fire conditions encountered in an operational context. All live fire training involves simulation. The extent to which a simulation reflects reality is referred to as fidelity:

The degree to which a model or simulation reproduces the state and behavior of a real world object or the perception of a real world object, feature, condition, or chosen standard in a measurable or perceivable manner; a measure of the realism of a model or simulation; faithfulness... 2. The methods, metrics, and descriptions of models or simulations used to compare those models or simulations to their real world referents or to other simulations in such terms as accuracy, scope, resolution, level of detail, level of abstraction and repeatability.

(Northam, n.d.)

Fidelity can be described in a number of different ways. One fairly simple approach is to examine physical and functional fidelity (see Figure 3). Physical fidelity is the extent to which the simulation looks and feels real. Functional fidelity is based on the extent to which the simulation works and reacts realistically.

Describing fidelity of a simulation as low, moderate, or high, is unlikely to provide adequate clarity. A more useful description of fidelity includes both qualitative and quantitative measures on multiple dimensions.

Describing fidelity of a simulation as low, moderate, or high, is unlikely to provide adequate clarity. A more useful description of fidelity includes both qualitative and quantitative measures on multiple dimensions. But what measures and dimensions? In a compartment firefighting simulation, key elements of physical fidelity will likely include fire behavior indicators such as Building, Smoke, Air Track, Heat, and Flame (B-SAHF).

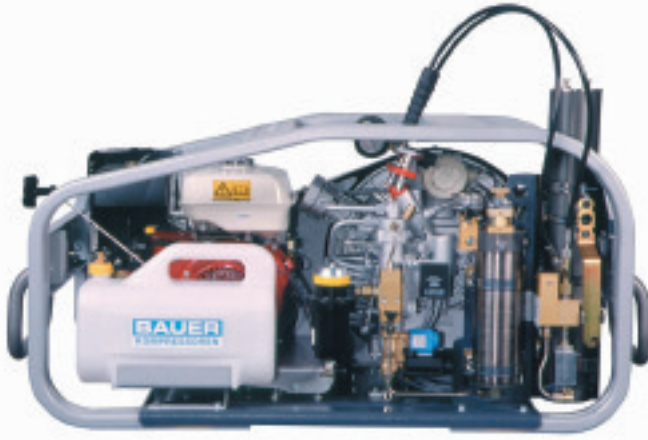
BAUER

COMPRESSORS




Verticus 5 /KAP 5 stationary compressor

The most advance modular unit system used in fire stations with SPC-compressor control B-CONTROL, P Filter System and integrated filling panel. The unit can be upgraded to a silenced unit VERTICUS 5 type and additional filter housings, refrigeration dryer AIR-KOOL, external filling panels as well as storage cylinders can be easily fitted.



Mariner 250/320

The power pack for larger delivery of air, 250l/m and 320l/min. A newly developed, super-light aluminium chassis guarantees the best protection against corrosion! Inter- and after coolers made of stainless steel resist the toughest climatic conditions. The construction of the motor rocker stand reduces vibration for smooth operation as well as self-tensioning of the v-belt drive.

BAUER offers only Independently Tested Containment Fill Stations which were found to protect the operator from overpressure and fragmentation per NFPA 1901.

Containment Fill Stations – Stationary & Mobile

High-Pressure Breathing Air Compressors and Auxiliary Equipment

Worldwide Sales and Service Network

BAUER COMPRESSORS ASIA PTE LTD

2 Penjuru Place, #01-05 Penjuru Tech Hub, 608783 Singapore

Tel: +(65) 6271 6271

Fax: +(65) 6272 3345

<http://www.bauergroup.com>

Email: info@bauer-compressors.com.sg





DIN EN 9601

TRAINING SIMULATION

Figure 3. Two-Dimensional Fidelity Matrix

		Physical Fidelity		
		Low	Medium	High
Functional Fidelity	Low			
	Medium			
	High			

Note: Adapted from *Fidelity Versus Cost and its Effect on Modeling & Simulation* (Duncan, 2007)

Important aspects of fidelity would include the characteristics of doors and windows (e.g., opening mechanism), hose and nozzles, and influence

fidelity depend on the intended learning outcome of the simulation. In fact, a simulation that focuses on critical contextual elements may be more effective than one that more fully replicates reality. However, at this point, we simply have unsupported opinion and in some cases anecdotal evidence of the effectiveness or lack of effectiveness of current training practices. The key to this puzzle is to clearly define the intended learning outcomes and identify the critical elements of context that are required.

Questions to be answered

Key questions for trainers and training program managers responsible for CFBT include:

- What degree of simulation fidelity is necessary to develop the knowledge and skills necessary for safe and effective operation on the fireground?
- What are the key elements of fidelity for various learning outcomes such as 1) developing understanding of fire development in a compartment, 2) dynamic risk assessment, inclusive of recognizing critical fire behavior indicators, 3) selecting appropriate fire control

The importance of the various aspects of fidelity depend on the intended learning outcome of the simulation. In fact, a simulation that focuses on critical contextual elements may be more effective than one that more fully replicates reality. However, at this point, we simply have unsupported opinion and in some cases anecdotal evidence of the effectiveness or lack of effectiveness of current training practices. The key to this puzzle is to clearly define the intended learning outcomes and identify the critical elements of context that are required.

of tactics such as gas and surface cooling on fire behavior. Replicating conditions encountered during emergency operations using an acquired structure would likely provide the most realistic context and correspondingly the greatest risk to participants.

On the surface it makes sense that increased fidelity would result in increased effectiveness and transfer of knowledge and skill. However, it is important to remember that simulations are a model of reality and "all models are wrong, but some models are useful" (Box & Draper, 1987, p. 424). The importance of the various aspects of

techniques, 4) developing competence and confidence when operating in a hazardous environment, 5) developing skill in nozzle operation and technique, 6) evaluating the effect of tactical operations.

- Is live fire training the only or most effective simulation method for achieving these learning outcomes? If so, what type of simulation will safely provide the required degree of fidelity? If not, what other simulation method may be used in place of, or in addition to live fire training to provide the required degree of fidelity?

Effective performance under stressful conditions such as those encountered during firefighting operations requires substantial training in a realistic context. However, effective training in this context presents considerable challenges.

Training effective task performance in stressful situations requires that the following conditions be met: (a) Trainees should be exposed to and familiarized with stressors characteristic of the criterion situation; such stressors should be introduced into the training process in a manner that (b) prevents the build-up of anxiety and (c) minimizes interference with acquisition of skills that the training is designed to promote.

(Friedland & Keinan, 1992, 157)

**Effective performance
under stressful conditions
such as those
encountered during
firefighting operations
requires substantial
training in a realistic
context. However,
effective training in this
context presents
considerable challenges.**

Examining the various dimensions of fidelity provides a starting point for a more substantive discussion of live fire training as simulation and critical elements of context for safe and effective fire training programs. **APF**

References

- Aristotle (1984) *Nicomachean ethics*. In *The complete works of Aristotle*, (J. Barnes, Ed.). Princeton, NJ: Princeton University Press
- Box, G. & Draper, N. (1987). *Empirical model-building and response surfaces*. San Francisco: Wiley.
- Duncan, J. (2007). *Fidelity versus cost and its effect on modeling & simulation*. Paper presented at Twelfth International Command and Control Research and Technology Symposium (12th ICCRTS), 19-21 June 2007, Newport, RI.
- Friedland, N. & Keinan, G. (1992) Training effective performance in stressful situations: Three approaches and implications for combat training. *Military Psychology*, 4 (3), 157-174.
- National Fire Protection Association (NFPA). (2007) NFPA 1403 Standard on Live Fire Training Evolutions. Quincy, MA: Author.
- Northam, G. (n.d.). *Simulation fidelity – Getting in touch with reality*. Retrieved May 2, 2009 from <http://www.siaa.asn.au/get/2395365095.pdf>

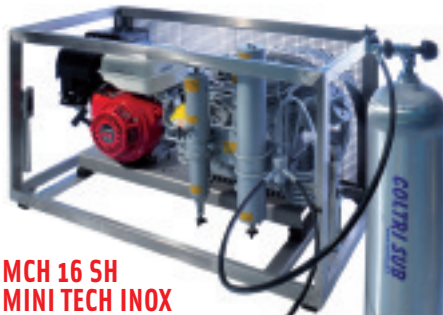


PURE BREATHING COMPRESSED AIR DEPENDABLE TECHNOLOGY



**MCH 30 SILENT
WITH DRIER**

500 Lt/min – 18 CFM, Fully automated, Stationary filling station, The refrigerated air drier extends filtration media lifespan 6 times



**MCH 16 SH
MINI TECH INOX**

265 Lt/min – 9.5 CFM, Light weight, Highly reliable, Portable station, Marine grade, Stainless steel frame, Also available with diesel and electric drive



MCH 6 SH

Ultraportable 100 Lt/min – 3.5 CFM, Small compressor only 37 Kg, Also available with single and triphase 3 Kw electric drive

Coltri Asia Pacific Co., Ltd.

Free Zone at 304 Industrial Park 2 No. 94/5, Moo. 3, T. Khao Hin Sorn – A. Phnom Sarakarm, Chachoengsao 24120 Thailand
Tel: + 66 38 855 103 to 5 Fax: + 66 38 855 106
mobile +66 81 8913937
c.benelli@aerotecnicacoltriasiapacific.com
www.aerotecnicacoltriasiapacific.com

Distributor and Representative Offices

BAUER COMPRESSORS

BANGLADESH

BIZ2SAFE ENTERPRISE PTE LTD

192/1 East Kafrul, Dhaka Cantonment,
Dhaka 1206, Bangladesh
Contact: Mr Gupta
Tel: 88 0 2 875 0010 or 9198 202 98969
Fax: 88 0 2 871 4400
Email: biz2save@gmail.com
Dealer/Distributor

BRUNEI

BAUER COMPRESSORS ASIA PTE LTD

2 Penjuru Place, #01-05 Penjuru Tech Hub
Singapore 608783
Contact: Mr Stephen Hines (Managing Director)
Tel: +65 6271 6271
Fax: +65 6272 3345
Email: info@bauer-compressors.com.sg
Bauer Subsidiary Office

FRENCH POLYNESIA

TAHITI SPORT

PO Box 62, 98713 Papeete
Tahiti, French Polynesia
Contact: Mr Thierry Alberola
Tel: +689 505959
Fax: +689 421775
Email: plongee@tahiti-sport.pf
Dealer/Distributor

INDONESIA

MARINE & INDUSTRIAL COMPRESSORS

304 Thomson Road, Singapore 307654
Contact: Mr Sng
Tel: +65 6250 6018
Fax: +65 6253 8443
Email: masmarin@singnet.com.sg
Dealer/Distributor

KOREA

TECKO CO LTD

2F, SK@Technopark, Mega-Dong
190-1 Sangdaewon-Dong, Sungnam-City
Kyungki-Do 462 807, Korea
Contact: Mr K Y Lee
Tel: +82 31 776 2442
Fax: +82 31 776 2444
Email: kylee@tecko.co.kr
Dealer/Distributor

MALAYSIA

SK CRYOGENICS SDN BHD

No. 16 Jalan Anngerik Mokara 31/52, Section 31,
Kota Kemuning, 40460 Shah Alam, Selangor,
Malaysia
Contact: Mr Steve Kellett
Tel: +60 3 5122 4269
Fax: +60 3 5122 4235
Email: steve@skcryogenics.com
Dealer/Distributor

PAKISTAN

ALPINE INDUSTRIALCON PVT LTD

305/2 G.T. Road, Baghbanpura, Lahore, Pakistan
Contact: Mr Kashif Ahmad
Tel: +92 42 685 2313
Fax: +92 42 655 3674
Email: alpinelahore@hotmail.com
Dealer/Distributor

PHILIPPINES

CEBU ERNBRI IMPORT INC/ AQUAVENTURE WHITETIP DIVE SUPPLY

Ermita Office: Unit 101 Joncor II Bldg, #1362 A.
Mabini Street, Ermita Manila Philippines 1000,
Philippines
Contact: Mr Brian L Giles
Tel: +632 521 0433
Fax: +632 522 1165
Email: brian@aquaventurewhitetip.com
Dealer/Distributor

SINGAPORE

BAUER COMPRESSORS ASIA PTE LTD

2 Penjuru Place
#01-05 Penjuru Tech Hub
Singapore 608783
Contact: Mr Stephen Hines (Managing Director)
Tel: +65 6271 6271
Fax: +65 6272 3345
Email: info@bauer-compressors.com.sg
Bauer Subsidiary Office

MARINE & INDUSTRIAL COMPRESSORS

304 Thomson Road
Singapore 307654
Contact: Mr C H Sng
Tel: +65 6250 6018
Fax: +65 6253 8443
Email: masmarin@singnet.com.sg
Dealer/Distributor

SRI LANKA

HALCHEM LANKA PVT LTD

No 7, Siri Dhamma Mawatha, Colombo 10, Sri Lanka
Contact: Mr Cyril Halloluwa Managing Director
Tel: +94 11 5843213 and 5843219 (Direct)
Fax: +94 11 2674 615 and 2792 406
Email: cyril.halloluwa@halchem-lanka.com
Website: www.halchem-lanka.com
Dealer/Distributor

TAIWAN

MING SHEN ENTERPRISE CO LTD

5, PaShih 1 Street, DanShui Town
Taipei, Taiwan 25170, Taiwan
Contact: Mr Tom Tseng
Tel: +886 (2) 2809 5789
Fax: +886 (2) 2809 6189
Email: tom@3arrow.com.tw
Dealer/Distributor

THAILAND

INTERSOL ENGINEERING & TECHNOLOGY PTE LTD

7/288 Moo 6, Chaengwattana Road
Bhanmai, Pakkred
Nonthaburi 11120
Thailand
Contact: Mr Nathanan
Tel: +66 2 9808754
Fax: +66 2 9808753
Email: nathanan@intersol.th.com
Dealer/Distributor

VIETNAM

FRANCO-PACIFIC VIETNAM CO LTD

55 Ho Hao Hon Street
District 1, Ho Chi Minh City
Vietnam
Contact: Mr Colm Minogue
Tel: +84 8 836 0257
Fax: +84 8 836 1387
Email: colmminogue@francopacific.com
Dealer/Distributor

MEKONG SCUBA SUPPLY LTD

2/14 Cao Thang Street
District 3, Ho Chi Minh City
Vietnam
Contact: Mr Mike Doyle
Tel: +848 832 8952
Fax: +848 832 8650
Email: mikedoyle44@hotmail.com
Dealer/Distributor

BLÜCHER GMBH

SINGAPORE

Contact: Mr Raymond Hoi
Account Manager Blücher Office
Singapore
Cell: +65 903 06972
Email: raymond@bluechersg.com
Website: www.bluecher.com
Representative Office

BRISTOL UNIFORMS

AUSTRALIA

PAC FIRE AUSTRALIA (formerly Pacific Helmets Australia)

Unit 1, 28 Burnside Road, Hallmarc Business Park
Yatala Qld 4207, Australia
Tel: +61 7 3441 7100
Fax: +61 7 3441 7177
Email: sales@pacfire.com.au
Website: www.pacfire.com.au
Dealer/Distributor

BANGLADESH

MANIK BROTHERS

Hai Mansion (3rd Floor), 9/3 Motijheel Circular Road
Dhaka – 1000, Bangladesh
Contact: Mr A K Bhowmick
Tel: +880 2 7100 589
Fax: +880 2 7100 386
Email: manikbrs@1postbox.com
Dealer/Distributor

BRUNEI

DASAPREM (M) SDN BHD

10 & 12 Jalan Muara 8/9, 40000 Shah Alam
Selangor, Darul Ehsan, Malaysia
Contact: Mr Prem R Murthy
Tel: +603 550 9060
Fax: +603 550 4486
Email: dasaprem@yahoo.com
Website: www.dasaprem.com
Dealer/Distributor

YEN LEE FIREWELD PTE LTD

18 Penhas Road, 208182, Singapore
Tel: +65 62909890
Fax: +65 62961444
Email: jeffrey@fireweld.com.sg
Dealer/Distributor

CHINA

SHENZHEN RUFN INDUSTRIAL CO LTD

RM-701, 7/F Leaser Tower
1st Fuhua Rd, Shenzhen, China
Contact: Amy Jin
Tel: +86 755 8399 9581
Fax: +86 755 8399 9548
Email: wj@ruffn88.com
Dealer/Distributor

FIJI

PHILLIPS & SMITH LTD

10 Akatea Road, Glendene
Auckland, New Zealand
Contact: Mr S Hampton
Tel: +649 818 8048
Fax: +649 818 4484
Email: stuart@firemaster.co.nz
Website: www.firemaster.co.nz
Dealer/Distributor

HONG KONG

CHUBB HONG KONG LTD

3 Hok Yuen Street East
Hung Hom, Kowloon
Hong Kong
Contact: Mr Simon Tsang
Tel: +852 2746 9628
Fax: +852 2785 0849
Email: simonsft.chubb.com.hk
Website: www.chubb.com.hk
Dealer/Distributor

INDIA

FOREMOST MARKETING PVT LTD

M-1 Green Park Extn,
New Delhi 110016 India
Contact: Mr Vinay Khanna
Tel: +91 11 261 969 82
Fax: +91 11 261 669 61
Email: foremost@vsnl.net
Website: www.foremostsafety.com
Dealer/Distributor

JAPAN**ABLE-YAMAUCHI CO LTD**

Yokohama Nishiguchi, SIA Building
10-36 Kitasaiwai
2-Chome Nishi-Ku
Yokohama 220-0004
Japan
Contact: S Yamauchi
Tel: +81 45 312 1130
Fax: +81 45 312 1350
Email: emiko@able-yamauchi.co.jp
Website: www.able.yamauchi.co.jp
Dealer/Distributor

MALAYSIA**DASAPREM (M) SDN BHD**

10 & 12 Jalan Muara 8/9, 40000 Shah Alam
Selangor Darul Ehsan, Malaysia
Contact: Mr Prem R Murthy
Tel: +603 550 9060
Fax: +603 550 4486
Email: dasaprem@yahoo.com
Website: www.dasaprem.com
Dealer/Distributor

EAST MALAYSIA**YEN LEE FIREWELD PTE LTD**

18 Penhas Road, 208182, Singapore
Tel: +65 62909890
Fax: +65 62961444
Email: jeffrey@fireweld.com.sg
Dealer/Distributor

NEW ZEALAND**PHILLIPS & SMITH LTD**

10 Akatea Road
Glendene
Auckland
New Zealand
Contact: Mr S Hampton
Tel: +649 818 8048
Fax: +649 818 4484
Email: Stuart@firemaster.co.nz
Website: www.firemaster.co.nz
Dealer/Distributor

SINGAPORE**YEN LEE FIREWELD PTE LTD**

18 Penhas Road
208182, Singapore
Tel: +65 62909890
Fax: +65 62961444
Email: jeffrey@fireweld.com.sg
Website: www.fireweld.com.sg
Dealer/Distributor

SRI LANKA**FIRETECH (PRIVATE) LTD**

34 Walter Gunsekara Mawatha
Nawala
Sri Lanka
Contact: Leon Daniels
Tel: +94 11 4410588
Fax: +94 11 2806666
Email: firetech@pan.lk
Dealer/Distributor

TAIWAN**SHENG-TAI FIRE PROTECTION INDUSTRIAL CO LTD**

No 222-2 Sec2
Cheng Tai Rd
Wu-Ku Shiang
Taipei, Hsien, Taiwan
Contact: Liu Yuan Hung
Tel: +886 22292 1751
Fax: +886 22291 1984
Email: sato@mail.mold.net.tw
Website: www.shengtai.com.tw
Dealer/Distributor

VIETNAM**TRAN VU TRADING CO LTD**

61 Ban Co Street, District 3
Hochiminh City
Viet Nam
Contact: Tran Vu Hong
Tel: +84 88325101
Fax: +84 88309586
Email: sales@tranvufire.com
Website: www.tranvufire.com
Dealer/Distributor

COLTRI ASIA PACIFIC**CHINA****SHANGHAI AND SOUTHERN CHINA:****SHANGHAI PANNY TRADING CO LTD**

3F,#17-2 No.230, Xinjinqiao Rd., Pudong new area,
Shanghai China
Contact: Mr Todd
Tel: +86-21-50321062
Fax: +86-21-50321063
Email: panny-ye@hotmail.com
Website: www.coltrisub-china.com
Dealer/Distributor

HONG KONG AND MACAU**WAH SHING COMPANY**

No. 2B-2C, G/F., Larch Street, Tai Kok Tsui,
Kowloon, Hong Kong SAR
Contact: Miss Jackio Kwok
Tel: +852 2391 3997, +852 2391 4084
Fax: +852 2789 4638
Email: wahshingcompany@gmail.com
Dealer/Distributor

INDIA**JYO TECH ENGINEERING & MARKETING**

H-49 A, Kalkaji, New Delhi 110019 India
Tel: +91 (11) 26447966
Fax: +91 (11) 26482189
Email: jyotech@del3.vsnl.net.in
Dealer/Distributor

INDONESIA**DIVEMASTERS INDONESIA JAKARTA**

Jl.Bangka Raya No.39A Jakarta 12720 Indonesia
Tel: +6221 7199045
Fax: +6221 7198974
Dealer/Distributor

BALI

Jl. By Pass I Gusti Ngurah Rai No. 314 Sanur,
Denpasar 80228 Bali
Indonesia
Tel: +62361 283138
Fax: +62361 285736
Email: sales@divemasters.co.id
Dealer/Distributor

LAUTAN MAS

Jl. Toko Tiga No. 24 Jakarta 11230 Indonesia
Tel: +62 (0) 21 690-1333
Fax: +62 (0) 21 690 2479
Email: info@lautanmas.com
Website: www.lautanmas.com
Dealer/Distributor

MALAYSIA**RAINBOW RUNNER S/B**

383D Jln Ampang 50450 Kuala Lumpur Malaysia
Tel: +60 (03) 42514368 or 42515368
Fax: +60 (03) 42511268
Branch: 3.06, Plaza Berjaya Jln Imbi 55100 Kuala
Lumpur Malaysia
Tel: +60 (03) 214814587
Fax: +60 (03) 21487440
Website: www.rainbowrunner.net
Dealer/Distributor

MALDIVES**MARKETECH MALDIVES PVT LTD**

M.Iramaa, 1st Floor, Fareedhi Magu
Rep of Maldives
Tel: +(960) 3331911
Fax: +(960) 3318815
Email: ahmed@marketechmaldives.com
Dealer/Distributor

NEW ZEALAND**AIR TECHNOLOGY LTD**

5/20 Constellation Drive
Mairangi Bay 0632 Auckland
PO Box 305065 Triton Plaza
North Shore
Auckland 0757
New Zealand
Contact: Ross Irvine
Tel: 64-9-478 9995
Fax: 64-9-478 6221
Website: www.divecompressors.co.nz
Dealer/Distributor

PHILIPPINES**AQUAMUNDO SPORTS INC**

G/FVerinda I Bldg., 120 Amorsolo St. Legaspi Village,
Makati City, Philippines 1229
Tel: (+632) 813-AQUA (2782)
(+632) 817-AQUA (2782)
Fax: Dial local 13
Email: info@aquamundosports.com,
scuba@aquamundosports.com
Dealer/Distributor

SINGAPORE**ALLROUND ADVANCED TECHNOLOGIES PTE LTD**

105 Sims Ave #03-06 Chancery Lodge Complex
Singapore 387429
Tel: +65 749 2778
Fax: +65 749 2977
Email: enquiry@allround.com.sg
Dealer/Distributor

KOREA, REPUBLIC OF**DAE WOONG SUITS CO LTD**

1614-15, Seocho-Dong, Seocho-Ku, Seoul, Korea
Tel: 82-2-588-0970
Fax: 82-2-587-0392
Email: mares@mares.co.kr
Website: www.mares.co.kr
Dealer/Distributor

TAIWAN**NELVEN CO LTD**

14F-6, No. 76, Sec. 1, Fu-Shings South Rd
Taipei City 106, Taiwan
Tel: (886) 2-2721-9770
Fax: (886)2-8773-2047
Email: nelven@ms18.hinet.net
Website: www.nelven.com.tw
Dealer/Distributor

THAILAND, VIETNAM, CAMBODIA, SRI LANKA**SIAM DIVING ENTERPRISES ASIA PACIFIC CO LTD**

No.12, Chaloeprakiat Ratchakan Thi 9 Road, Soi
48, Dokmai, Prawet, Bangkok, 10250, Thailand
Tel: +66 2 726-6101-5
Fax: +66 2 726-6106
Email: c.benelli@aerotecnicacoltriasiapacific.com,
sdesystems@csloxinfo.com
Website: www.aerotecnicacoltriasiapacific.com
Dealer/Distributor

VIETNAM**SCUBA SUPPLY**

120/54a Nguyen Thien Thuat Street, Nha Trang,
Vietnam
Tel: +84 (0) 914 029 790
Fax: +84 (0) 58 252 0576
Email: craig@scubavietnam.com
Website: www.scubavietnam.com
Dealer/Distributor

CON-SPACE COMMUNICATIONS**CHINA****ANCOM SYSTEMS, INC**

Building 5, Courtyard 10, Beijing
Contact: Wang, Jacinta F
Tel: 86-10-6202-2792
Email: jwang@ancom.cn
Dealer/Distributor

BEIJING CBT MACHINE & ELECTRIC EQUIPMENT INC

Room 503, Building H
Timecourt, No. 6 yard
Beijing
Contact: Chou, Yu
Tel: 010-84440107/8
Email: hillcity1@yahoo.com
Dealer/Distributor

OCEANS SAFETY EQUIP CO LTD

Rm19A 10 & 11, Jazz Mansion, Shenzhen
Contact: Zhang, Echo
Tel: 86-755-8328-0633
Email: andy_oceans@hotmail.com
Dealer/Distributor

WUXI NEW FIRETRE SAFETECH LTD

Block 3 Long Shan Wen Bo Industrial Park
Wuxi, Jiang Su PRC
Contact: Wang, Chad
Tel: 86 510 139 0619 8090
Email: chwang1001@hotmail.com
Website: www.wfs.com.cn

Dealer/Distributor**HONG KONG****EASTERN FORUM FE CO LTD**

Unit A2, 1/F No 1123 Canton Road, Mongkok
Contact: Fung, Eddy K P
Tel: 852-278-734-64
Email: efung@rescue.com.hk
Website: www.rescue.com.hk

Dealer/Distributor**SUPREME CO**

Room 1812, Park-In Commercial Center, Mong Kok
Contact: Chau, Gary
Tel: 852-27808818
Email: info@supremeco.com.hk
Website: www.supremeco.com.hk

Dealer/Distributor**INDONESIA****P.T. MITRA TEKNIKATAMA**

Jl Ekor Kuning No: 1, Jakarta
Contact: Prabowo, Budhi
Tel: 62-21 6602144
Email: mitra.teknikatama@gmail.com

Dealer/Distributor**JAPAN****TEISEN – TEIKOKU SERI-I CO LTD**

103-0027, Tokyo
Contact: Katano, Yasu
Tel: 81 3 3281 3033
Email: yasuhide.katano@teisen.co.jp
Website: www.teisen.co.jp

Dealer/Distributor**KOREA****KEO WHA R & F CO LTD**

RM 1, FL 1, Jiwoo Building, Seoul
Contact: Zyung, Kenneth
Tel: 82 02 335 0145 7
Email: jfckenneth@yahoo.co.kr

Dealer/Distributor**MACAO****ARTIGOS ELECTRICOS TICO**

Rua Dos Pescadores, 180 Edf. Ind. Veng Hou,
7 And. Macau
Contact: Weng Kei, Leong
Tel: 853-28923023
Email: tico@macau.ctm.net
Website: www.tico.com.mo

Dealer/Distributor**MALAYSIA****ALL DEFENCE TECHNOLOGY PTE LTD**

14 Jansen Close, Singapore
Contact: Phua Augustine
Tel: 065 6387 8887
Email: gus@alldefence.qsurl.org

Dealer/Distributor**WASILAH HOLDINGS SDN BHD**

No 15 & 17, Jin 3/4C, Kuala Lumpur
Contact: Abdullah, Nor Aziliza
Tel: 603 410 761 01
Email: azliza@wasilahholdings.com

Dealer/Distributor**PHILIPPINES****RESQTEK INDUSTRIAL SALES**

402 Paltoc St. Sta. Mesa, Manila
Contact: Agudo, Donn
Tel: 632 715 3660
Email: resqtek@gmail.com

Dealer/Distributor**SINGAPORE****DEFENCE SECURITY PTD LTD**

37 Yu Li Industrial Bldg, Singapore
Contact: Lim, Robert
Tel: 674-32-180
Email: robertlim@defencesecurity.com.sg
Website: www.defencesecurity.com.sg

Dealer/Distributor**TAIWAN****SUPER PREMIUM CO LTD**

18F-5, No. 16, Jian Ba Road
Chung Ho City
Contact: Yeh, Annie
Tel: 886-2-822-65-855
Email: spctwn@ms9.hinet.net

Dealer/Distributor**THAILAND****S.P. & ASSOCIATES LTD**

40/747 1st Fl Moo 10 Nuanjan R
Khet Buengkum
Contact: Eddie, E
Tel: 66-2-946-1593-98
Email: sp@sp-associates.co.th

Dealer/Distributor**SEA AIR THAI CO LTD**

98 Soi Ramintra 49, Bangkok
Contact: Raskin, Craig
Tel: 668-7900-0783
Email: craskin@gmail.com
Website: www.seaairthai.com

Dealer/Distributor**VIETNAM****APTES VIETNAM, JSC**

Ground floor, 39 Nguyen Trai Tower
Ha Noi
Contact: Le Tung, Dao
Tel: 84 4 568 1886
Email: tung.dao@aptcs.vn
Website: www.aptcs.vn

Dealer/Distributor**LACVIET TECHNICAL SCIENTIFIC & ELECTRIC CO LTD**

152 Nguyen Hong Dao Str Ward 14
Ho Chi Minh City
Contact: Nguyen, Tuan
Tel: 84 8 8492 734
Email: bpkd_lacvietco@hcm.fpt.vn
Website: www.lacviettech.com.vn

Dealer/Distributor**AUSTRALIA****KDW CONSULTING LLC**

3023 Sonoma Way, Viera
FL 32955, USA
Contact: Kenton D Warner
Tel: 321 636 4543
Fax: 928 438 6382
Email: kenwarner@att.net
Website: www.cuttersedge.com

Representative Office**CHINA****ANCOM**

Building 5, Courtyard 10 Village
Middleroad, North 3rd Ring Road
Contact: Pei Zhang
Tel: 86 10 6202 2792
Fax: 86 10 6207 7929
Email: hung.fang@utoronto.ca
Website: www.ancom.cn/www.cuttersedge.com

Dealer/Distributor**NORLAN ENTERPRISES INC**

Room 952, #218 Tang Li Road
China
Contact: Helen Wang
Tel: 86 10 8467 3721/8467 3722
Fax: 86 10 8467 3770
Email: helenwang@norlan.cn
Website: www.norlan.cn/www.cuttersedge.com

Dealer/Distributor**WUXI NEW FIRETRE SAFETECH LTD**

Block 3, Long Shan Wen Bo Industrial Park
Qian Yao Road, Hu Bin District
Wuxi, Jiangsu Province, PRC 214151
Tel: +86 510 8225 5991
Fax: +86 510 8275 4257
Email: mail@wfs.com.cn
Website: www.wfs.com.cn

Dealer/Distributor**INDIA****ASKA EQUIPMENTS LTD**

Aska House, 193 Deepali, Deepali Chowk, Outer Ring
Road – Pitampura, New Delhi 110 034, India
Contact: Navdeep Garg
Tel: 91 11 27014416/27014417
Fax: 91 11 27014413
Email: info@askagroup.com
Website: www.askagroup.com/
www.cuttersedge.com

Dealer/Distributor**ISRAEL****OFER FIRE RESCUE & SALVAGE LTD**

Binyamina 30500, Israel
Contact: Ofer Halamish
Tel: 972 4 6288444
Fax: 972 4 6288555
Email: ofer@ofer.co.il
Website: www.ofco.il/www.cuttersedge.com

Dealer/Distributor**JAPAN****TEIKOKU SEN-I CO LTD**

5-13,2 Chome, Nihonbashi, Chuo-Ku,
Tokyo 103, Japan
Tel: 81-3-3281-3026
Fax: 81-3-3274-6397
Email: teisen-tyo@teisen.co.jp
Website: www.teisen.co.jp/www.cuttersedge.com

Dealer/Distributor**KOREA****KDW CONSULTING LLC**

3023 Sonoma Way, Viera, FL 32955, USA
Contact: Kenton D Warner
Tel: 321 636 4543
Fax: 928 438 6382
Email: kenwarner@att.net
Website: www.cuttersedge.com

Representative Office**MALAYSIA****CITO MARKETING, SDN BHD**

No. 11, Jalan SS15/4B, Subang Jaya
47500 Petaling Jaya, Selangor, Darul Ehsan
Contact: Ahmad Nazmi Abu Raihan
Tel: +603 5631 1286
Fax: +603 5634 0583
Email: info@citogroup.co.my
nazmi@citogroup.com.my/www.cuttersedge.com

Dealer/Distributor**PHILIPPINES****KDW CONSULTING LLC**

3023 Sonoma Way, Viera, FL 32955 USA
Contact: Kenton D Warner
Tel: 321 636 4543
Fax: 928 438 6382
Email: kenwarner@att.net
Website: www.cuttersedge.com

Representative Office**SINGAPORE****KDW CONSULTING LLC**

3023 Sonoma Way, Viera, FL 32955 USA
Contact: Kenton D Warner
Tel: 321 636 4543
Fax: 928 438 6382
Email: kenwarner@att.net
Website: www.cuttersedge.com

Representative Office**SOUTH KOREA****JINUTEC INTERNATIONAL DIVISION**

711 Visiontop Officetel 374-4
Won-Dong, Osan-City, South Korea
Contact: Na Hae-Yul
Tel: 82 31 375 8558
Fax: 82 31 375 4884
Email: hyna@jinutec.com
Website: www.jinutec.com/www.cuttersedge.com

Dealer/Distributor

THAILAND**KDW CONSULTING LLC**

3023 Sonoma Way, Viera, FL 32955 USA
 Contact: Kenton D Warner
 Tel: 321 636 4543
 Fax: 928 438 6382
 Email: kenwarner@att.net
 Website: www.cuttersedge.com
Representative Office

Dräger**AUSTRALIA****DRAEGER SAFETY PACIFIC**

Axxess Corporate Park, Unit 99, 45 Gilby Road
 Mount Waverley, Victoria 3149
 Tel: +61 3 9265 5000
 Fax: +61 3 9265 5097
 Email: customer.service@draeger.com
Representative Office

CHINA**BEIJING FORTUNE DRAEGER SAFETY EQUIPMENT CO LTD**

Yu An Lu 22, B Area
 Beijing Tianzhu Airport Industrial Zone
 Shunyi District, Beijing, 101300
 Tel: +86 10 8049 8000
 Fax: +86 10 8049 8005
 Email: sales.safety.cn@draeger.com
Representative Office

INDIA**JOSEPH LESLIE DRAEGER MFG PVT LTD**

Leslico House, Prof. Agashe Road
 Off 87-C, Bhavani Shankar Road
 Dadar (West), Mumbai 400028
 Tel: +91-22-2422 1880/1878/7198
 Fax: +91-22-2430 3705
 Email: mumbai@lesliedraeger.com
Representative Office

INDONESIA**PT DRAEGERINDO JAYA**

Beverly Antasari Building
 Jl. Pangeran Antasari No. 67, Unit L
 Cilandak Barat, Jakarta, Selatan 12430
 Tel: +6221 751 3289
 Fax: +6221 751 2052
 Email: product_support@draeger.co.id
Representative Office

JAPAN**DRAEGER SAFETY JAPAN LTD**

3-8-1 Toyo Koto-ku
 Tokyo, Japan, Japan Zip 135-0016
 Tel: +81 3 44 615111
 Fax: +81 3 44 615100
 Email: sales.safety.jp@draeger.com
Representative Office

KOREA**DRAEGER SAFETY ASIA**

Daejong Bld. #1106
 Bang-l-dong, Songpa gu
 Seoul, Korea
 Tel: +82 2 6415 8222
 Fax: +82 2 6415 8223
 Email: sdseo3@magicn.com
Representative Office

MALAYSIA**DRAEGER SAFETY ASIA PTE LTD**

No. 14, Jalan PJS 11/18, Bandar Sunway 46150
 Petaling Jaya, Malaysia
 Tel: +60 3 5635 6460
 Fax: +60 3 5635 4171
 Email: dsa.malaysia@draeger.com
Representative Office

NEW ZEALAND**DRAEGER SAFETY PACIFIC PTE LTD**

Unit O, No. 150
 Harris Road, East Tamaki, Auckland
 Tel: +649 273 3160
 Fax: +649 273 3159
 Email: customer.service@draeger.com
Representative Office

SINGAPORE**DRAEGER SAFETY ASIA PTE LTD**

67 Ayer Rajah Crescent #06-03
 Singapore 139950
 Tel: +65 6872 9281
 Fax: +65 6512 1908
 Email: dsa.singapore@draeger.com
 Website: www.draeger.com.sg
Regional Head Office

TAIWAN**DRAEGER SAFETY TAIWAN CO LTD**

12/F, Kuohwa Building
 868-5 Chungcheng Road, Chungho City
 Taipei County, 235 Taiwan R.O.C.
 Tel: +886 (02)2223-6388
 Fax: +886 (02)2223-2258
 Email: sales.taiwan@draeger.com
Representative Office

THAILAND**DRAEGER SAFETY (THAILAND) LTD**

123/20, Nonsi Road
 Kwaeng Chongnonsi
 Khet Yannawa, Bangkok 10120
 Tel: +662 6811 781 (4 lines)
 Fax: +662 6811 780
 Email: sales.thailand@draeger.com
Representative Office

VIETNAM**DRAEGER SAFETY ASIA PTE LTD**

No. 5, A2 Nguyen Khanh Toan Str.
 Cau Giay District, Hanoi, Vietnam
 Tel: +84 4 281 3463
 Fax: +84 4 281 3461
 Email: sales.safety.vn@draeger.com
Representative Office

DUPONT FIRE EXTINGUISHANTS**UNITED ARAB EMIRATES****FENWAL PROTECTION SYSTEMS**

Bu Ameem Building II, Suite 201
 PO Box 30791, Dubai
 United Arab Emirates
 Contact: Tareq El-Iman
 Tel: 971 4.337.2498
 Fax: 971 4.337.5088
 Email: tareq.imam@kiddeme.co.ae
 Website: www.fenwalfire.com
Dealer/Distributor

KIDDE FIRE SYSTEMS

Bu Ameem Building II, Suite 201
 PO Box 30791, Dubai
 United Arab Emirates
 Contact: Tareq El-Iman
 Tel: 971 4.337.2498
 Fax: 971 4.337.5088
 Email: tareq.imam@kiddeme.co.ae
 Website: www.kiddefiresystems.com
Dealer/Distributor

Fike**AUSTRALIA****FIRE PROTECTION TECHNOLOGIES PTY LTD**

Unit 14, 42-44 Garden Blvd
 Dingley, Victoria 3712
 Australia
 Tel: +61 3 9558 0715
 Fax: +61 3 9558 0725
 Email: Enquiries@fire-protection.com.au
 Website: www.fire-protection.com.au
Dealer/Distributor

BANGLADESH**NAVANA INTERLINKS LTD**

7, Champaklal Udyog Bhavan
 Sion (E) Mumbai 400 022, India
 Tel: +88 02-9892911
 Fax: +88 02-9895252
 Email: info@navana-iv.com
 Website: www.navana-iv.com
Dealer/Distributor

HONG KONG**THE JARDINE ENGINEERING CORPORATION LTD**

13/F Somerset House, Taikoo Place
 979 King's Road, Hong Kong
 Tel: +852 2807 4684
 Fax: +852 2503 4210
 Email: yick-kuen.kwong@jec.com
 Website: www.jec.com
Dealer/Distributor

INDIA**NEWAGE INDUSTRIES**

Champaklal Udyog Bhavan
 Unit No. 7, Sion (East), Mumbai 100 022, India
 Tel: +91 22 2407 7421
 Fax: +91 22 2407 4229
 Email: info@newage-india.com
 Website: www.newage-india.com
Dealer/Distributor

INDONESIA**KARYA LESTARI MAKMUR PT**

Jl. Pangeran Jayakarta, 85AK, Jakarta 10730,
 Indonesia
 Tel: +62 21 628 1933
 Fax: +62 21 628 1976
 Email: johnklima@cbn.net.id
Dealer/Distributor

KOREA**PARADISE INDUSTRY CO LTD**

#683-116 Hannam-Dong, Yongsan-Ku
 Seoul, South Korea
 Tel: +82 2 3780 8770
 Fax: +82 2 3780 8772
 Email: shlee@paradise-ind.co.kr
 Website: www.paradise-ind.co.kr
Dealer/Distributor

MALAYSIA**FIKE ASIA PACIFIC SDN BHD**

18B, 2nd Floor, Jalan Astak U8/L
 Bukit Jelutong, 40150 Shah Alam, Selangor, Malaysia
 Tel: +60 3 7859 1462
 Fax: +60 3 7859 1461
 Email: chun-wah.leong@fike.com
 Website: www.fike.com
Representative Office

SUKIADA ENGINEERING SDN BHD

No. 20 Jalan Astaka U8/L, Bukit Jelutong
 40150 Shah Alam, Selangor, Malaysia
 Tel: +60 3 7845 2008
 Fax: +60 3 7845 6008
 Email: bk Wong@sukiada.com.my
 Website: www.sukiada.com.my
Dealer/Distributor

PAKISTAN**MGH ENGINEERING AND CONTROL PVT LTD**

H. # 20 St., #5/A Kot Shahabdin
 Shahdrah, Lahore 54950
 Pakistan
 Tel: +92 - 42 - 7913064
 Fax: +92 - 42 - 7913064
 Email: mansoorshaker@yahoo.com
 Website: www.mgheng.com
Dealer/Distributor

PHILIPPINES**FIRE SOLUTIONS INC**

1028 Malaya Street, Malanday
 Marikina City
 1805 Philippines
 Tel: +63 2 371 9774
 Fax: +63 2 374 3041
 Email: firesolutions@skyinet.net
Dealer/Distributor

SINGAPORE**AZCEND ASIA PTE LTD**

Blk 21, Kallang Avenue #04-165
Singapore 339412
Tel: (65) 6299 0798
Fax: (65) 6299 3735
Email: rtiong@azcendasia.sg
Representative Office

SRI LANKA**BUILDING SERVICES (M&E) ENGINEER INTERNATIONAL PVT LTD**

No. 20/39, Fairfield Gardens
Colombo 08, Sri Lanka
Tel: +94 11 4717 500
Fax: +94 11 2667 569
Email: bldserv@sltnet.lk
Dealer/Distributor

TAIWAN**SUNMORN INC**

7F-2, 76, Nan Jing W. Road
Taipei 10352, Taiwan
Tel: +886 2 2550 3500
Fax: +886 2 2550 5350
Email: merylyu@sunmoreinc.com
Website: www.sunmoreinc.com
Dealer/Distributor

THAILAND**ANTI-FIRE CO LTD**

316-316/1, Sukhumvit 22 Road
Klongtoey, Bangkok 10110, Thailand
Tel: +66 2 260 4565
Fax: +66 2 258 2422
Email: sithichai@antifire.com
Website: www.antifire.com
Dealer/Distributor

FIRE FIGHTING ENTERPRISES

AUSTRALIA**AMPAC TECHNOLOGY PTY LTD**

97 Walters Drive, Perth, Australia 6017
Tel: +61 892 423 333
Fax: +61 892 423 334
Website: www.ampac.net
Dealer/Distributor

BAHRAIN**KHAYBER TRADING COMPANY**

W.L.L, PO Box No. 1976, Cr.No. 40189-01
Manama, Bahrain
Dealer/Distributor

CYPRUS**M.T. PIPERARIS TRADING LTD**

Nafpactou 19a, Lemesos 3051, Cyprus
Tel: +357 5 737311
Fax: +357 5 737310
Dealer/Distributor

ISRAEL**TELEFIRE FIRE & GAS**

Detectors Ltd, PO Box 7036
Petach-Tikva 49250, Israel
Tel: +972 3 9211955
Fax: +972 3 9211816
Dealer/Distributor

IRAN**NAR KOOB IRAN**

Apt 7, 3rd Floor, No 32, Varavini St.
Amir Atabak, St. Ostad Motahari Ave.
Tehran – Iran
Tel: +98 21 88842649
Fax: +98 21 88307405
Dealer/Distributor

KOREA**HI MAX CO LTD**

Sicox Tower, 115-Ho 513-14
Sangdaewon-Dong, Jungwon-Gu
Sungnam-City, Kyungki Do, Korea
Tel: +82 31 769 7698
Dealer/Distributor

MALAYSIA**FITTERS ENG SERVS SDN BHD**

No.1 Block C, Jalan Dataran, Sd1 Pju 9
52200 Bandar Sri, Damansara
Kuala Lumpur, Malaysia
Tel: +60 3 62767155
Fax: +60 3 62758712
Dealer/Distributor

NEW ZEALAND**AMPAC INDUSTRIES LTD**

PO Box 100-149
North Shore Mail Centre
Glenfield, Auckland
Tel: +64 94438072
Fax: +64 94438073
Dealer/Distributor

QATAR**AL SHAIBEH ESTABLISHMENT**

PO Box 3975, Doha, Qatar
Tel: +974 4322140
Fax: +974 4416650
Dealer/Distributor

SINGAPORE**ACCLAIM SYSTEMS PTE LTD**

Blk 104, Boon Keng Road, 05-01
Singapore 339775
Tel: +656 2990 798
Fax: +656 299 3735
Dealer/Distributor

ALARM SUPPLY PTE LTD

63 Jalan Pemimpin, 03-07
Pemimpin Industrial Bldg
Singapore 577219
Tel: 00 656 258 3445
Fax: 00 656 258 6428
Dealer/Distributor

SRI LANKA**FIRETECH (PVT) LTD**

34, Walter Gunasekara
Mawatha, Nawala
Sri Lanka
Tel: +94 1 806613
Fax: +94 1 806666
Dealer/Distributor

SYRIA**ESS COMPANY**

PO Box 35478, Damascus, Syria
Dealer/Distributor

TAIWAN**HORING LIH IND CO LTD**

4f No 18 Lane 327
Chung Shan Road
Sec 2 Chung-Ho-City
Taipei Hsien, Taiwan
Tel: +886 2224 87599
Fax: +886 2224 07752
Dealer/Distributor

THAILAND**TEEYA MASTER SYSTS CO LTD**

100/101-102 Vongvanji
Building B, 30th Flr
Rama 9 Road, Huaykhwang
Bangkok 10320, Thailand
Tel: +662 2 6451130
Fax: +662 2 2488540
Dealer/Distributor

UNITED ARAB EMIRATES**NAFFCO**

PO Box 17014, Jebel Ali Free Zone Area
Dubai, U.A.E
Tel: +971 4 881 5653
Fax: +971 4 881 6229
Dealer/Distributor

TELECTRON

PO Box 2946, Al Salam Street
Bldg. No.5, Abu Dhabi, U.A.E
Tel: +971 26795333
Fax: +971 26794609
Dealer/Distributor

HOLMATRO RESCUE EQUIPMENT

AUSTRALIA**CHUBB FIRE SAFETY LTD**

120, Silverwater Road, Silverwater, NSW 2128
Locked Bag 102, Silverwater 1811
Contact: Andrew Loftus
Tel: 1300 369 309
Fax: 02 8748 7450
Email: firesafety@chubb.com.au
Website: www.chubb.com.au
Dealer/Distributor

BRUNEI**IECS SDN BHD**

13A Simpang 544-22, Jalan Jerudong
B.S.B. Brunei Darussalam
Contact: Roger Sim
Tel: +673 2 612 717
Fax: +673 2 612 720
Email: iececs.brunei@gmail.com
Dealer/Distributor

CHINA**HOLMATRO CHINA****UNIT 14/D – 9 JOY TOWER**

9 Zhen Ning Road, Shanghai 200050, P. R. China
Contact: Floris Evers
Tel: +86 21 5238 7330
Fax: +86 21 5238 7320
Email: china@holmatro.com
Website: www.holmatro-china.com
Representative Office

HONG KONG**ABLESLINK CO LTD**

Unit B4, 2/F., Block B
Sheung Shui Plaza, 3 Ka Fu Close
Sheung Shui, N.T., Hong Kong
Contact: Mr Randy Hau
Tel: +852-2466 4568
Fax: +852-2466 4569
Email: ableslink@yahoo.com
Dealer/Distributor

INDONESIA**PT ESA KARYA MANDIRI JL.SUNTER PARADISE**

Timur Raya, F21 No.C42, Jakarta 14350
Contact: Mr Benny N Liem
Tel: 062-21-6412936/65303502
Fax: 062-21-6412937
Email: esakarya@cbn.net.id
Dealer/Distributor

JAPAN**AKAO & CO LTD**

4-13-1 Shinmachi Nishi-ku, Osaka, Japan 550-0013
Contact: Masaya Saga
Tel: +81-6-6532-6256
Fax: +81-6-6532-3095
Email: info@akao-co.co.jp
Website: www.akao-co.co.jp
Dealer/Distributor

KOREA (SOUTH)**KEO WHA HITEC CO LTD**

Rm-1Fl, Jiwoo Bldg, 376-12
Seogyo-dong, Mapo-gu, Seoul, Korea
Contact: Mr Kenneth Zyung
Tel: 82-(02)-336-0145-7
Fax: 82-(02)-336-0180
Email: jfckenneth@yahoo.co.kr
Website: www.kh-hitec.com
Dealer/Distributor

MACAU SAR**TCT TRI-CONTINENTAL TRADING COMPANY LTD**

4/F-“E”, Dynasty Plaza Bldg., 411-417
Ald. Dr. Carlos D’Assumpcao Macau S.A.R.
Contact: John Ferreira
Tel: +853 2875-0008
Fax: +853 2875-0007
Email: sales@tct.com.mo, john@tct.com.mo,
hanson@tct.com.mo
Website: www.tct.com.mo
Dealer/Distributor

MALAYSIA**PANDAN NIAGA SDN BHD**

No. 81A
Jalan Tabla 33/21
Shah Alam Technology Park
Seksyen 333
40400 Shah Alam
Selangor Darul Ehsan
Malaysia
Contact: Mohd Rashdi Abd Rahman
Tel: +603 5122 1310
Fax: +603 5122 1279
Email: pnsb@pn.com.my
Dealer/Distributor

NEW ZEALAND**CHUBB FIRE & SAFETY**

3 Fisher Crescent
Mt Wellington
Auckland
Contact: Steve Kirk
Tel: +64 9 270 7441
Fax: +64 9 270 7235
Email: fireandsafety@chubb.co.nz
Website: www.chubb.co.nz
Dealer/Distributor

PHILIPPINES**WALLGREEN INDUSTRIAL VENTURES CORP**

62 West Avenue
Quezon City
Philippines 1104
Contact: Francisco C Dizon
Tel: +6 32 411 0818
Mobile: +6 32 0917 820 1947
Fax: +6 32 411 0818
Email: wivcor@yahoo.com
Dealer/Distributor

SINGAPORE**FABRISTEEL PRIVATE LIMITED**

9, Tuas Ave 10
Singapore 639133
Contact: Adros Sunan/Spencer Ong
Tel: +65 68623830
Fax: +65 68615988
Email: adros.sunan@fabristeel.com.sg
Dealer/Distributor

TAIWAN**PARKSON TRADING CO LTD**

No. 50, 3F
Hua-Ning Rd
Guo Shan Dist.
80471 Kaohsiung City
Taiwan, R.O.C.
Contact: Mr Johnson Peng
Tel: +886-7-552-1650
Fax: +886-7-552-7999
Email: ptckpeng@parkson.com.tw
Dealer/Distributor

PAC FIRE AUSTRALIA (formerly Pacific Helmets Australia)

AUSTRALIA**PAC FIRE AUSTRALIA (formerly Pacific Helmets Australia)**

Unit 1
28 Burnside Road
Hallmarc Business Park
Yatala Qld 4207
Australia
Tel: +61 7 3441 7100
Fax: +61 7 3441 7177
Email: sales@pacfire.com.au
Website: www.pacfire.com.au
Representative Office

**AUSTRALIA****ADA (AUSTRALIAN DEFENSE APPAREL PTD LTD)**

14 Gaffney Street
Coburg, Victoria 3058
Contact: Rob Walsh, Sales & Marketing Manager
Emergency Services
Tel: +61 3 9353 4552
Email: rob@ada.com.au
Website: www.ada.com.au
Garment Maker

BRUCK

Units 12/13
79-83 High Street
KEW Victoria 3101
Australia
Contact: Michael Smith
Tel: +61 4 0324 7309
Email: MSmith@Bruck.com.au
Approved PBI Weaver

LION APPAREL – ASIA PACIFIC

Asia Pacific – Protective Systems Group
Unit 3
15 Dunstan Road
Wingfield
South Australia
5013 Australia
Contact: Warren Hoare, Regional Managing Director
Tel: +61 8 8139 7777
Email: warrenh@lionapparel.com
Garment Maker

PAC FIRE

Unit 1, 28 Burnside Road
Hallmarc Business Park
Yatala Qld 4207
Australia
Contact: Keith Ward, Managing Director
Tel: +61 7 3441 7100
Email: keith@pacfire.com.au
Garment Maker

STEWART & HEATON

150 Francisco Street
Belmont WA 6104 Australia
Contact: Brian Thomson, Business Development Manager
Tel: +61 8 9277 5555
Email: brian.thomson@shcc.com.au
Garment Maker

CHINA**YINGTELAI TECHNOLOGY CO LTD**

76 Xihuan Road, ChangPing District
Beijing 102200, China
Contact: Xue Feng LIU, Vice Chairman General Manager
Tel: +86 10 6974 2811
Email: xuefeng@yingtelai.com
Garment Maker

HONG KONG**WAH TAI ENTERPRISES LTD**

7/F Block F
Golden Bear Industrial Centre
66-82 Chai Wan KOK Street
Tsuen Wan N.T. Hong Kong
Hong Kong SAR
Contact: Johnny Ho, President, Special Products Division
Tel: +852 2771 6360
Email: jho@wah-tai.com
Agent

KOREA**SEOJIN TEX**

Room 201 Kum Ho Building, Soongin-Dong
Jongro-gu Seoul, 110550
Korea (Republic of)
Contact: C. J. Yoon, Director
Tel: +82 2 253-7905
Email: seojintex@naver.com
Weaver

KOREA**SAN CHEONG COMPANY LTD**

185 Songmoon-Ri-Myun
Cheoin-Gu, Yongin-si
Gyeonggi-Do 449-823
Korea (Republic of)
Contact: Soo Youk Lee
Tel: +82 31 321 4077
Email: isu@sancheong.com
Website: www.sancheong.com
Garment Maker

SECURITON

ASIA PACIFIC**SECURITON (M) SDN BHD**

No. 19A, Lorong Rahim Kajai 13
Taman Tun Dr. Ismail, MY-60000
Kuala Lumpur, Malaysia
Contact: Mr Lewis Chong
Tel: +60 3 7725 1699
Fax: +60 3 7725 1677
Email: asia@securiton.com.my
Website: www.securiton.com
Representative Office

AUSTRALIA**AUSTRALIAN FIRE ENTERPRISES (AFE)**

PO Box 7027, Mannerling Park
NSW 2259, Australia
Contact: Mr Mike Donegan/Mr Brett Gordan
Tel: +61 2 43 592 244
Fax: +61 2 43 593 301
Email: sales@austfire.com.au/afe@ozemail.com.au
Dealer/Distributor

NATIONAL SECURITY & SURVEILLANCE

38 Lambert Street Richmond
Victoria 3121, Australia
Contact: Mr Dominic Paruit
Tel: +61 3 9428 8055
Fax: +61 3 9428 8065
Email: dominic.paruit@natss.com.au
Website: www.natss.com.au
Dealer/Distributor

CHINA, BEIJING**SECURITONG FIRE TECHNOLOGY LIMITED COMPANY**

Room 2101, Block 1, No. 58
East 3rd Ring South Road
Chaoyang Area, Beijing, China
Contact: Mr Gong Xinjun
Tel: +86 10 5867 2076
Fax: +86 10 5867 3319
Email: gxjbj@163.com
Dealer/Distributor

SWISS SECURITAS FIRE AND SECURITY SYSTEMS TECHNOLOGY (BEIJING) CO LTD

Room 1808-11
18th Floor Shouchuang Mansion
No.6 North Street, Chaoyangmen
Dongcheng Area
Beijing 100027, P.R.China
Contact: Mr Lewis Chong/Mr Todd Zeng
Tel: +86 10 6406 0558
Fax: +86 10 6406 6934
Email: todd.zeng@securiton.cn
Website: www.securiton.cn
Dealer/Distributor

BEIJING Z-N MECHANICAL & ELECTRICAL EQUIPMENT CO LTD

1 #B910,Lingdi Office
No.13 Beiyuan Lu
Chaoyang District Beijing
China 100012
Contact: Ms Sarah Zhang
Tel: +86 10 5207 3836
Fax: +86 10 5207 3839
Email: sarahzh@vip.sina.com/
bjzhongna@yahoo.com.cn
Dealer/Distributor

CHINA, SHANGHAI**BARTEC ELECTRIC (SHANGHAI) CO LTD**

New Building 7, No. 188, Xijun Ring Road, Shanghai
Caohejing Pujiang Hi-Tech Park (Pudong Area)
Minhang District 201114 Shanghai P.R. China
Contact: Mr Banson Tang
Tel: +86 21 3463 7288 ext: 251
Fax: +86 21 3463 7282
Email: fanmin@bartec.com.cn
Website: www.bartec.com.cn

Dealer/Distributor**DEF CHINA**

2nd Floor Building 135.
No.1421 East Zhuanxing Road, Minhang Area
Shanghai 201108
Contact: Mr François Yang
Tel: +86 21 3350 7133- +86 21 3350 8012
Fax: +86 21 3350 7285
Email: farech@sh163.net
Website: www.def-online.com

Dealer/Distributor**SWISS SECURITAS (BEIJING) CO LTD
SHANGHAI COMPANY**

Room A, 23rd Floor Shimei Mansion
No. 445 Jiangning Road
Jing'an Area
Shanghai 200041, P.R.China
Contact: Mr Lewis Chong/Mr Todd Zeng
Tel: +86 21 5228 8111
Fax: +86 21 5228 8325
Email: todd.zeng@securiton.cn

Dealer/Distributor**SHANGHAI ZHENYE INDUSTRY CO LTD**

No, 3 221
Cao Bao L
Shanghai, 200233
Contact: Mr Jack Shen
Tel: +86 21 6451 2922/2933
Fax: +86 21 6451 9955
Email: sy1199@163.com
Website: www.shzhenye.com

Dealer/Distributor**CHINA, SHENZHEN****FANWO GROUP**

18F, China Economic and Trade Building
Zizhuoqiao, Futian District, Shenzhen, China 518040
Contact: Dr Yao
Tel: +86 755 83222 076/+86 755 83222 872
Fax: +86 755 83222 311
Email: yaohaowei@gmail.com
Website: www.china-hrd.com

Dealer/Distributor**SHENZHEN YAOHUAI CHINA CO LTD**

RM.F, 20th Floor Yong – Hui Building
Guo-Qi Building
Shenzhen
Contact: Mr Raymond Ng/Ms Shi
Tel: +86 755 8212 9831
Fax: +86 755 8212 9909
Email: rng@ywk.com.hk
Website: www.ywk.com.hk

Dealer/Distributor**HONG KONG****YIU WAH (KOGARAH) CO LTD**

Room 901, 9th Floor
No 113 Argyle Street
Mongkok
Kowloon
Hong Kong
Contact: Mr Raymond Ng
Tel: +852 2781 1384
Fax: +852 2782 6652
Email: ywk@ywk.com.hk
Website: www.ywk.com.hk

Dealer/Distributor**INDIA, MUMBAI****BAJAJ ELECTRICALS LTD**

15/17, Sant Savta Marg
Reay Road
Mumbai – 400010
Contact: Mr Ravichandran Sr. (General Manager)
Tel: +91 22 2372 4192
Fax: +91 22 2373 0504
Email: bms@bajajelectricals.com
Website: www.bajajelectricals.com

Dealer/Distributor**VIMAL FIRE CONTROLS PVT LTD**

19/20 Vardhaman Service
Industrial Estate, L.B.S. Marg.
IN-400083 Vikhroli (West) Mumbai, India
Contact: Mr Vijay Doshi/Mr Nalin Doshi
Tel: +91 22 2578 3335
Fax: +91 22 2578 3338
Email: nalin@vimalfire.com/falgun@vimalfire.com
Website: www.vimalfire.com

Dealer/Distributor**HSE ENGINEERS PVT LTD**

2, Durgas Niwas, 1st Floor
Bhawani Tower Compound
Behind Bhawani Petrol Pump
IIT Powai, Mumbai 400076, India
Contact: Mrs Sapna Prajapati
Tel: +91 22 2578 7014 / 7015
Fax: +91 22 2578 7016
Email: hsemumbai@hseengineers.com
Website: www.hseengineers.com

Dealer/Distributor**KOREA (SOUTH)****ROYAL INDUSTRIAL TECHNOLOGY
CORPORATION**

Royal Building, 3rd Floor
840-5 Yeoksam-Dong
Kangnam-Ku, Seoul 135080, Korea
Contact: Mr E S Kim/Mr J K Chung
Tel: +82 22 009 1800
Fax: +82 2 567 8831
Email: kes@ritco.co.kr/jkchung@ritco.co.kr
Website: www.ritco.co.kr

Dealer/Distributor**MALAYSIA****FITTERS DIVERSIFIED BERHAD**

No, 1 Jalan Tembaga SD5/2, Sri Damansara
52200 Kuala Lumpur
Contact: Dato' Richard Wong/Mr K K Fong
Tel: +60 3 6276 7155
Fax: +60 3 6175 2780
Email: kkfong@fittersgroup.com
Website: www.fittersgroup.com

Dealer/Distributor**SYARIKAT LETRIK CHEN GUAN SDN
BHD**

Lot 1178 Jalan Subang 3, Taman Industri Sg.
Penaga, 47610 Subang Jaya, Selangor, Malaysia
Contact: Mr Choong Yew Lim
Tel: +603 5634 1436
Fax: +603 5634 2349
Email: chenguan@streamyx.com

Dealer/Distributor**PAKISTAN****EVERGREEN DEVELOPMENT
CORPORATION**

Suite # 514, 5th Floor
Clifton Centre
Block 5 Kehkashan, Clifton
Karachi 75600, Pakistan
Contact: Mr Munawar Afridi
Tel: +92 21 5873 448
Fax: +92 21 5870 080
Email: genco@cyber.net.pk
Website: www.edcpl.com

Dealer/Distributor**SINGAPORE****ACCLAIM SYSTEMS PTE LTD**

Blk 21 Kallang Ave # 04-165
Singapore 339412
Contact: Mr Michael Mok
Tel: +65 6299 0798
Fax: +65 6299 3735
Email: michael.mok@aspl.com.sg
Website: www.acclaim.sg

Dealer/Distributor**SWISS SECURITAS ASIA PTE LTD**

No. 56 Serangoon North Ave 4
#06-03, Singapore 555851
Singapore
Contact: Mr Andy Gan/Mr Michael Boon
Tel: +65 6853 8066
Fax: +65 6853 5939
Email: mike.boon@securitas.sg
Website: www.securitas.sg

Dealer/Distributor**TAIWAN****ATLAS TECHNOLOGY CORPORATION**

22F, No 1 Bausheng Road
Yunghe City, Taipei
Taiwan 234, R.O.C.
Contact: Mr David Liu
Tel: +886 2 223 20 556
Fax: +886 2 223 16 657
Email: david@atlasgroup.com.tw/
hunter@atlasgroup.com.tw
Website: www.atlasgroup.com.tw

Dealer/Distributor**KGIC TECHNOLOGY CO LTD**

No 36, Yingming 1st Road
Qianzhen District
Kaohsiung City 80649
Taiwan R.O.C.
Contact: Mr Franco Lee
Tel: +886 7 715 4285/+886 7 7715 829
Fax: +886 7 711 2811
Email: lic@ms9.hinet.net

Dealer/Distributor**UNIVERSAL PATHS DEVELOPMENT
CORPORATION (UPDC)**

9F-1, 306, Sec. 1, NeiHu Road
Taipei 114, Taiwan R.O.C.
Contact: Mr Terry Chung/MS Ellie Chou
Tel: +886 2 8751 6055
Fax: +886 2 8751 6053
Email: ellie@updc.com.tw
Website: www.updc.com.tw

Dealer/Distributor**THAILAND****AEGIS FIRE SAFETY CO. LTD**

19/9 Pechphirun Building 3rd Floor
Thetsabansongkhro Road Ladyao
Chatujak, Bangkok 10900
Contact: Mr Quek Yong Siah
Tel: +66 2158 0338
Fax: +66 2158 0340
Email: ysquek@aegis-fs.com

Dealer/Distributor**FIRETRADE ENGINEERING CO LTD**

Contact: Mr Taksin Tantipijit
21/56 Soi Soonvijai, Rama IX Road
Bangkapi, Huaykwang
Bangkok 10320 Thailand
Contact: Mr Taksin Tantipijit
Tel: +66 2641 4707
Fax: +66 2203 0533
Email: taksin@firetrade.co.th

Dealer/Distributor**AUSTRALIA****FIRE & RESCUE AUSTRALIA PTY LTD**

190 Main Rd, Blackwood
South Australia, 5051
Contact: Dale Thompson
Tel: +61 8 8370 2739
Fax: +61 8 8370 2738
Email: dale@fireandrescueaustralia.com

Dealer/Distributor**FIRE & SAFETY WA**

96 Furniss Rd, Landsdale
Western Australia, 6065
Contact: Kerry Lovett
Tel: +61 8 9302 3210
Fax: +61 8 9302 6110
Email: kerry.lovett@fireandsafetywa.com.au

Dealer/Distributor

SOLBERG ASIA PACIFIC PTY LTD

PO Box 182, Kingswood NSW 2747
Australia
Contact: Ted Schaefer (Technical Manager)
Tel: 61 2 9673 5300
Email: ted@solbergfoams.com
Website: www.solbergfoams.com
Representative Office

MALAYSIA**RHINOSHIELD INDUSTRIES(M) SDN BHD**

H-0-5 Ground Floor Plaza Damas
No. 60 Jalan Sri Hartamas 1
Sri Hartamas
50480 Kuala Lumpur, Malaysia
Contact: C K Lim (General Manager)
Tel: +603 62033850
Fax: +603 62032245
Email: rhinoshield@pd.jaring.my
Dealer/Distributor

SINGAPORE**CMA ENGINEERING SINGAPORE PTE LTD**

1, Yishun St. 23, #04-01 YS-One
Singapore 768441
Contact: Christopher Lee
Tel: +65 6563 6860
Fax: +65 6563 2366
Email: chrislee@cma.com.sg
Dealer/Distributor

**AUSTRALIA****GAAM EMERGENCY PRODUCTS**

29 Temple Dr., PO Box 211
Thomastown
Victoria 3074
Australia
Tel: +61 3 9466 1244
Fax: +61 3 9466 4743
Email: iprice@tycoint.com
Website: www.gaam.com.au
Dealer/Distributor

CHINA**SHANGHAI JINDE INDUSTRY DEVELOPMENT CO LTD**

Room 610, 1 Lane 50
Xin Cun Road
Shanghai, 200065, China
Tel: +86 21-360-50599
Fax: +86 21-360-55599
Email: jmgushon@online.sh.cn
Dealer/Distributor

HONG KONG**ROTTER INTERNATIONAL LTD**

Unit A G/F., Hung To Road
6-8 Hung To Road
Kowloon, Hong Kong
Tel: 85227517770
Fax: 85227562051
Email: jacky@rotter.com.hk
Dealer/Distributor

INDIA**FOREMOST TECHNICO PVT LTD**

M-1, Green Park Extension
New Delhi 110016, India
Tel: +91 (11) 2619 6982
Fax: +91 (11) 2616 6961
Email: foremost@hathway.com
Website: www.foremost-india.com
Dealer/Distributor

INDONESIA**PT PALMAS ENTRACO**

Jl. Krekot 85, Jakarta-Pusat, Indonesia
Tel: +62 (21) 384 1681
Fax: +62 (21) 380 2660
Email: sales@palmas.co.id
Dealer/Distributor

JAPAN**YONE CORPORATION**

23, Nishinakaai-Cho, Nishinokyo
Nakagyo-Ku, Kyoto 604, Japan
Tel: +81 (7) 582-11185
Fax: +81 (7) 580-12263
Email: t.yone@myad.jp
Website: www.yone-co.co.jp
Dealer/Distributor

KOREA (SOUTH)**SHILLA FIRE CO LTD**

433-11 Non Hon-Dong, Nam Dong-Gu
Inchon City 405-300, South Korea
Tel: +82-02-3665 9011
Fax: +82-02-3663 9113
Email: kofire77@hotmail.com
Website: www.firekorea.com
Dealer/Distributor

MALAYSIA**SENTRIX TECHNOLOGY SDN BHD**

No. 2A-2, 1st Floor Jalan USJ 21/7
UEP Subang Jaya, 47630 Subang Jaya
Selangor Darul Ehsan, Malaysia
Tel: +603 8023-5228
Fax: +603 8023-5618
Email: chong@sentrrix.com.my
Website: www.sentrrix.com
Dealer/Distributor

NEW ZEALAND**TYCO SAFETY PRODUCTS**

6 Portage Road
New Lynn Auckland 0600, New Zealand
Tel: +64 9 826 1707
Fax: +64 9 826 1740
Email: sgurnick@tycoint.com
Website: www.tycosafetyproducts.com
Dealer/Distributor

PAKISTAN**FIRESTOP PVT LIMITED**

6/B, 1st Floor, Dinar Chambers
PO Box # 5786
West Wharf Road
Karachi-74000
Pakistan
Tel: 9221-2315675, 2313065
Fax: 9221-2310457, 5831015
Email: info@firestopaids.com
Website: www.firestopaids.com
Dealer/Distributor

PHILIPPINES**ALLIANCE INDUSTRIAL SALES**

Unit 4, Finlandia Town Homes
#1700 Dian, cor. Finlandia Street
Brgy, San Isidro, 1234 Makati City, Philippines
Tel: +63 21 7546 1749
Fax: +63 2 887 7173
Email: alliance8_jcy@pacific.net.ph
Dealer/Distributor

SINGAPORE**S.K. ROSENBAUER PTE LTD**

8 Tuas Drive 2
Singapore 638643, Singapore
Tel: +65 6862 3155
Fax: +65 6862 0273
Email: houchin@skrosenbauer.com
Website: www.skrosenbauer.com
Dealer/Distributor

TAIWAN**YONE CORPORATION**

23, Nishinakaai-Cho, Nishinokyo
Nakagyo-Ku, Kyoto 604, Japan
Tel: +81 (7) 582-11185
Fax: +81 (7) 580-12263
Email: t.yone@myad.jp
Website: www.yone-co.co.jp
Dealer/Distributor

THAILAND**ANTI-FIRE, CO LTD**

316-316/1, Sukhumvit 22 Road
Klongtoey Klongtoey
Bangkok 10110, Thailand
Tel: +66 2259 6898
Fax: +66 2258 2422
Email: sithichai@antifire.com
Website: www.antifire.com
Dealer/Distributor

THE S.E.A. GROUP**AUSTRALIA****SAFETY EQUIPMENT AUSTRALIA PTY LTD**

35/1 Jubilee Avenue
Warriewood, NSW 2102 Australia
Tel: +61 2 9910 7500
Fax: +61 2 9979 5364
Email: sea.australia@theseagroup.com
Website: www.sea.com.au
Representative Office

**SINGAPORE****TYCO FIRE SUPPRESSION & BUILDING PRODUCTS**

2 Serangoon North Avenue 5, #07-01 Fu Yu Building
Singapore 554911, Singapore
Tel: (+65) 6577 4360
Fax: (+65) 6481 8791
Email: sales-ap@tycofp.com
Website: www.tycosfbp.com
Representative Office

ANSUL

2 Serangoon North Avenue 5, #07-01 Fu Yu Building
Singapore 554911, Singapore
Tel: (+65) 6577 4360
Fax: (+65) 6481 8791
Email: sales-ap@tycofp.com
Website: www.ansul.com
Representative Office

HYGOOD

2 Serangoon North Avenue 5, #07-01 Fu Yu Building
Singapore 554911, Singapore
Tel: (+65) 6577 4360
Fax: (+65) 6481 8791
Email: sales-ap@tycofp.com
Website: www.hygood.co.uk
Representative Office

PYRO-CHEM

2 Serangoon North Avenue 5, #07-01 Fu Yu Building
Singapore 554911, Singapore
Tel: (+65) 6577 4360
Fax: (+65) 6481 8791
Email: sales-ap@tycofp.com
Website: www.pyrochem.com
Representative Office

SKUM

2 Serangoon North Avenue 5, #07-01 Fu Yu Building
Singapore 554911, Singapore
Tel: (+65) 6577 4360
Fax: (+65) 6481 8791
Email: sales-ap@tycofp.com
Website: www.skum.com
Representative Office

SABO FOAM

2 Serangoon North Avenue 5, #07-01 Fu Yu Building
Singapore 554911, Singapore
Tel: (+65) 6577 4360
Fax: (+65) 6481 8791
Email: sales-ap@tycofp.com
Website: www.sabofoam.com
Representative Office

SUBSCRIPTIONS

ASIA PACIFIC FIRE MAGAZINE

GET YOUR SUBSCRIPTION NOW!!!



**APF IS PUBLISHED 4 TIMES A YEAR
– MARCH, JUNE, SEPTEMBER
AND DECEMBER**

Name: _____

Company/Organisation: _____

Address: _____

Telephone: _____

Fax: _____

E-mail: _____

Start Subscription from Issue: _____

Subscription Rates: Sterling £50.00 AUS Dollars – \$100.00
US Dollars – \$70.00

Back Issues: US \$18.00, £10.00 or AUS Dollars \$20
each inclusive of P&P (subject to availability)

METHODS OF PAYMENT:

Website Subscription: www.mdmpublishing.com

Cheque: _____ MDM Publishing Ltd.

Visa/Mastercard No: _____

Expiry Date: _____ Security Code: _____
(last three digits on reverse of card)

If paying by credit card please fax details. DO NOT post/mail.
Fax: +44 (0) 1935 426926

MDM Publishing Ltd.

The Abbey Manor Business Centre, The Abbey, Preston Road,
Yeovil, Somerset BA20 2EN, United Kingdom

ADVERTISERS' INDEX

Bauer Compressors Asia Pte Ltd	61
Bio-Ex	21
Blücher GmbH	56
Bristol Uniforms Ltd.	21
Coltri Asia Pacific	63
Chemguard, Inc.	51
Con-Space Communications	19
Control Logic s.r.l.	58
Cutters Edge	16
Dafo Fomtec AB	33
Dräger Safety Asia Pte Ltd.	OBC
Dr. Sthamer Hamburg	31
DuPont Fire Extinguishants	24
Elkhart Brass Mfg Co Inc	28
Fike Corporation	38
Fire Fighting Enterprises	27
Firetrace International	43
Gielle s.r.l.	55
Holmatro Rescue Equipment	19
Iveco Magirus Fire Fighting GmbH	52
Janus Fire Systems	27
NFPA	04
PAC Fire Australia	47
PBI Performance Products, Inc.	IBC
Plastika Akrapovic	44
Securiton AG	41
Simulation Ltd	57
Solberg Asia Pacific Pty. Ltd.	30
Super Vacuum Manufacturing Inc.	23
Task Force Tips, Inc.	IFC
Texas A & M Emergency Services Training Institute	22
The S.E.A. Group	34
Tyco Fire Suppression & Building Products – Asia Pacific – Ansul	08
Unifire, Inc.	15

PBI Matrix®... The Power Grid.



Better performance, better comfort and better value in outer shell protection. PBI Matrix® takes PBI's proven protective characteristics of unmatched flame and thermal protection to another level by reinforcing them with a unique grid of high strength aramid filament fiber — for unsurpassed performance and durability. Tough and rugged, PBI Matrix responds call after call and remains service worthy by providing increased resistance to rips, tears and abrasions. This revolutionary outer shell is lightweight, fast drying, and offers superior comfort and reliability. More than just premium protection, it's a valuable asset in your fire fighting arsenal. PBI Matrix...the switch is on.



PBI Performance Products, Inc. // 9800 Southern Pine Blvd Suite D // Charlotte, NC 28273 // 704-554-3815 // walt.lehmann@pbiprducts.com

Im Gewerbepark D23 // D-93059 Regensburg, Germany // T +49 (0) 941 465 275 9-9 // F +49 (0) 941 465 275 9-8 // helmut.zepf@pbiprducts.com



www.pbiprducts.com

00:00:00

00:00:03

**The new Dräger HPS 6200:
with Q-Fix, giving a quick and secure mask attachment.**

Protect your head with just a single click: with the Dräger HPS 6200 full-shell helmet, attaching your mask takes seconds. A single hand movement is all it takes using the Q-Fix mask attachment system, developed by Dräger, to secure your mask in place.

The Dräger HPS 6200 is currently the lightest EN 443:2008-compliant helmet approved for category B use on the market today. It has been developed in close collaboration with our customers and is produced by Dräger at our own manufacturing facilities. The benefits are clear to see: a contemporary design and new levels of safety and comfort, all combined to provide head protection that is nothing short of superb. To find out more about the Dräger HPS 6200, visit www.draeger.com/hps6200

APF

An MDM PUBLICATION
Issue 35 – September 2010

www.mdmpublishing.com

ASIA PACIFIC FIRE MAGAZINE



REPORTING TO THE ASIA PACIFIC FIRE PROTECTION AND FIRE SERVICE INDUSTRY

TASK FORCE TIPS, INC.



3701 Innovation Way, Valparaiso, IN 46383-9327 USA
International +1.219.548.4000 • www.tft.com • intsales@tft.com

QuadraCup

Selectable Foam Nozzle

110, 230, 360 & 470 l/min
38 mm Coupling



The TFT QuadraCup is a rugged and dependable selectable gallonage nozzle with a retractable foam aspiration sleeve. When the outer sleeve is in the retracted position, the nozzle operates the same as the TFT QuadraFog. Flow can be set to any one of four settings, or to a flush mode. The front end can be rotated from straight stream through wide fog patterns. Uniquely cut fixed metal fog teeth produce a wide range of fog patterns. Available in either tip-only configuration or with a stainless steel ball shutoff, the QuadraCup is also available with optional colored pistol grip and handle covers (NFPA 1901 (A.16.9.1)).

QuadraFog Selectable Liter Nozzle



Stainless Steel Fog Teeth

Fog Teeth made from 316 stainless steel offer enhanced resistance to damage and increased corrosion resistance. Strong equipment designed to last a long time in harsh environments.

110, 230, 360 & 470 l/min
Selectable Nozzle
Fixed or Spinning Teeth

Top Quality Material

With one heavy duty Stainless Steel ball valve to shutoff the nozzle you get a 100% reliable and low maintenance unit.

NFPA 1964
Compliant

For excellent quality fire fighting equipment visit www.tft.com and call your local distributor for a demonstration. Display equipment, literature and digital data can be obtained by contacting your trained TFT distributor.



AUSTRALIA

Gaam Emergency Products-AU
Phone : 61394661244
Fax : 61394664743
iprice@tycoint.com
www.gaam.com.au



INDONESIA

Pt Palmas Entraco
Phone: +62 (21) 384 1681
Fax: +62 (21) 380 2660
sales@palmas.co.id



NEW ZEALAND

Tyco Safety Products
Phone: 6445608127
Fax: 6498270844
tsp.sales.nz@tycoint.com
www.tycoservices.co.nz



SOUTH KOREA

Shilla Fire Co., Ltd.
Phone: 820236659011
Fax: 820236639113
kofire77@hotmail.com
www.firekorea.com



HONG KONG

Rotter International Ltd.
Phone: 85227517770
Fax: 85227562051
jacky@rotter.com.hk
www.rotterbiz.com



JAPAN / TAIWAN

Yone Corporation
Phone: 81758211185
Fax: 81758012263
t.yone@myad.jp
www.yone-co.co.jp



PHILIPPINES

Alliance Industrial Sales
Phone: 6328908818
Fax: 6328960083
alliance8_jcy@pacific.net.ph



THAILAND

Anti-fire Co., Ltd.
Phone: 66 2 259-6898
Fax: 66 2 258-2422
sithichai@antifire.com
www.antifire.com



INDIA

Foremost Technico Pvt Ltd
Phone: +91 (11) 2619 6982
Fax: +91 (11) 2616 6961
foremost@hathway.com
www.foremost-india.com



MALAYSIA

Sentrix Technology Sdn Bhd
Phone: +603 8023-5228
Fax: +603 8023-5618
chong@sentrix.com.my
www.sentrix.com.my



SINGAPORE

S.K. Fire Pte. Ltd.
Phone: 6568623155
Fax : 6568620273
houchin@skfire.com
www.skfire.com



VIETNAM

Tan Duc Joint Stock Company
Phone: 84-88990 678
Fax: 84-88990 698
techdyn@hcm.fpt.vn

www.tft.com

September 2010 Issue 35



Front Cover Picture: Beijing's Forbidden City

Publishers
Mark Seton & David Staddon

Group Editor
Graham Collins

Editorial Contributors
George Gan, Mike Willson, David McLoughlin, James Eades, Kurt Werner, Keith Klassen, Jamie Hansen, Graham Collins

APF is published quarterly by:
MDM Publishing Ltd
The Abbey Manor Business Centre,
The Abbey, Preston Road, Yeovil,
Somerset BA20 2EN, United Kingdom
Tel: +44 (0) 1935 426 428
Fax: +44 (0) 1935 426 926
Email: mark.seton@apfmag.com
Website: www.mdmpublishing.com

©All rights reserved

Subscription Rates
Sterling – £50.00
AUS Dollars – \$100.00
US Dollars – \$70.00
(Prices include Postage and Packing)
ISSN – 1476-1386

DISCLAIMER:
The views and opinions expressed in ASIA PACIFIC FIRE MAGAZINE are not necessarily those of MDM Publishing Ltd. The magazine and publishers are in no way responsible or legally liable for any errors or anomalies made within the editorial by our authors. All articles are protected by copyright and written permission must be sought from the publishers for reprinting or any form of duplication of any of the magazines content. Any queries should be addressed in writing to the publishers.

Reprints of articles are available on request. Prices on application to the Publishers.

Page design by Dorchester
Typesetting Group Ltd
Printed in Singapore

Contents



21-24



27-31



37-40



47-48

03 From the Editor

05 NFPA Foreword

07-18 News &
Product Profiles

21-24 Smoke
Detection Safeguards
China's Heritage
Buildings

27-31
Fluorotelomer Based
Foams - Are They Safe
for Continued Use?

33-35 Fire
Suppression for
Roaring 40s' Wind
Turbines

37-40 Victoria
Bushfires Commission
- The Need for Change

43-45 Answering
the Bushfire Royal
Commission's Call

47-48 Sydney ARFF
Takes Delivery of a
New Aerial Firefighting
Vehicle

51-52 Clouds in the
Forecast

54 Aviation Fire
Experts to Meet in
Australia

57-59 Cut, Crush &
Prop

61-63 Compressed
Air Foam - What's It All
About?

65-68 Fighting Fire
with Thermal Imaging

70-71 Can Do in
Cambodia

72-79 Distributor &
Representative Office
Listing

80 Advertisers' Index



51-52



57-59



61-63



70-71



CHINA FIRE

2010

**The Fourteenth International Fire Protection Equipment,
Technology Conference & Exposition**

Organizer: China Fire Protection Association (CFPA)

October 13-15, 2010
Beijing, China

Tel: +86-10-87789262/87789261

Fax: +86-10-87789785

Email: chinafireexpo@126.com

www.fireexpo.cn

www.china-fire.com



By Graham Collins

Time Is Never On Our Side

The world seems to be staggering from one natural disaster to another and every time you switch on your television to the news channel, the cost and toll of human suffering seems to have increased exponentially.

The fact is though that, as yet at least, we can neither predict nor, to a great extent, control these events. Sure, we know, for example, when the monsoon season comes around in Pakistan, where in the world earthquakes are most likely to strike and where crops are most at the mercy of prolonged drought. But how heavy the rainfall is going to be, how high the up the Richter Scale the quake is going to be recorded and precisely when and how much rain will fall onto parched crops is quite beyond us.

So, there is a sense that chaos reigns, and the challenges are often simply too big for us to prepare for or overcome. But is this necessarily the case when it comes to fire?

equipment and skills are in place, and in full working order. And unlike a natural disaster where there is a sense in which the disaster itself is unstoppable, this is not the case with a fire. An earthquake, for example either takes place or it does not; a river bank is either breached or it is not – there are rarely any half measures. But, with the exception of it being the aftermath of a crash or an explosion, a major fire always starts as a small fire. So, stop the small fire, and you stop the big fire.

This is touched on in several of the articles in this edition of Asia Pacific Fire. There are two articles relating to the final report of the Victoria bushfires Royal Commission, which highlighted the need for the “early evacuation of residents”.

Too many buildings have woefully inadequate evacuation routes. Worse still, how many times do we have to read about buildings where evacuation routes are blocked, either intentionally or accidentally in ignorance of the risk to public safety?

In some countries there are still far too many buildings put up where standards and codes are either ignored or where those responsible for their enforcement fail to ensure that the standards are complied with. Too many buildings have woefully inadequate evacuation routes. Worse still, how many times do we have to read about buildings where evacuation routes are blocked, either intentionally or accidentally in ignorance of the risk to public safety? Then there are the issues of failing to update risk assessments and ensuring that the fire safety equipment is maintained in proper working order.

So, while we cannot predict when a fire will occur any more than we can a volcanic eruption, we can make sure that when it does the right

One of these articles, for instance, looks at proven technology that is available to help spot a bushfires at the embryonic stage in “a few minutes or even seconds”. Elsewhere in these pages is an article describing the early detection technology that has been installed in China’s Forbidden City; plus there is an article on a fire detection and suppression system that has been installed in wind turbines in Australia that has been shown to snuff out a fire before it has had any chance to take hold.

Time is never on our side but, thankfully, technology is. So, as always, we have endeavoured to share with you a broad cross-section of articles on the latest fire protection and firefighting solutions.

APF

MEMBERSHIP



Up-To-Date? It's Up to You!

NFPA® membership is indispensable for more than 81,000 professionals worldwide. What about you? It's an easy decision for anyone involved with protecting people and property, because NFPA keeps members on top of breakthroughs, research, and technology...and in control of their careers. **Join now and SAVE 10%** on NFPA codes, products, and seminars, while **you stay up-to-date** with:

- **NFPA Journal®**, the award-winning bimonthly membership magazine loaded with articles, codes and standards information, investigations, case studies, and reports
- Answers to your code questions from NFPA's experienced fire protection specialists
- Online issues of **NFPA News** for codes and standards activities, and **NFPA Update** for training opportunities and events
- FREE membership in any of 16 industry-specific sections including Fire Service; Building Fire Safety Systems; Health Care; Electrical; and Architects, Engineers, and Building Officials
- The latest **NFPA Journal Buyers' Guide**—your bonus gift valued at \$40

Gain a decided advantage on the job. Join NFPA today!

Become part of the world's largest organization for fire, electrical, and building safety professionals and stay up-to-date for only \$150 annual dues—satisfaction guaranteed.

**To join call 1-617-770-3000, or visit
nfpacatalog.org.**



By David Nuss

**NFPA Division Manager –
Wildland Fire Protection**

David Nuss is NFPA Division Manager – Wildland Fire Protection. For more information go to www.nfpa.org

Foreword

Meeting the Wildfire Challenge

Wildfire is an inevitable process of nature. What also seems inevitable, as a result of global climate change and continued human development in wildland areas, is an increase in the likelihood, severity and impact of wildland fires in the coming years. What is not inevitable, however, is the continued significant loss of property and threat to life as a consequence of those fires.

For the past eight years, the National Fire Protection Association (NFPA) through its highly successful Firewise program has played a significant role in reducing the impact of wildfire.

Firewise is a program designed to involve homeowners, community leaders, planners, developers, and others to protect people, property, and natural resources from the risk of wildland fire by creating fire-adapted communities. The program is designed specifically to reduce the inevitability of property loss and threat to life. Now closing in on 600 recognised communities, Firewise is a perfect example of a program that relies on collaboration with many entities and agencies for its success. NFPA has also shown, through the Fire-Safe Cigarette campaign that such a well-orchestrated campaign that draws on all the program areas at NFPA, coupled with coordination with our existing and new partners, can lead to success.

That is my vision for the newly created Wildland Fire Operations Division here at NFPA – to continue to build on our success with Firewise, while creating new and effective partnerships, both domestic US and international. Firewise will continue to serve as the cornerstone of our efforts to be proactive in reducing the potential threat of wildland fires to people and property. At the same time, we will identify and implement other strategies that use NFPA's expertise in public outreach, education, research, data analysis, and technical code and standard development to create a

collaborative effort with our partners and other organisations. An equally important part of the strategy is to reach out and listen to our partners, members, and other associations and organisations to help us identify areas where NFPA can make an impact on wildland fire losses.

As a fire protection professional for the past 30 years I have seen and experienced first-hand the effects of wildland fires and realised that structural firefighting was a much more controlled event than wildland fires. I have also seen firsthand that the devastation so often associated with wildfires does not have to occur; there are many examples from every major wildland fire in the United States that illustrate the positive effects of an individual property owner or community embracing the concepts of fire-adaptive strategies to reduce the risk. We have all seen the pictures of that lone house that remains standing among all the destruction, where the owner practiced Firewise principles and survived.

After more than 20 years as a regulator in municipal government, I understand clearly that people do not want to be told what to do with their homes and property. They must be encouraged to take action on their own to do the right thing. It is making and relaying that compelling argument that holds the future to success in reducing the inevitability of the impact on people and homes in the wildland urban interface. As an international organisation, NFPA is more than equipped and qualified to do the job. **APF**

This is an abridged version of an article that appeared originally in the NFPA Journal®, March/April 2010 and was reprinted with permission.



MDM Publishing
WORLDWIDE MEDIA

www.mdmpublishing.com

Hi-Tech Portal Site

FEATURING

FULL VIRTUAL ARCHIVE OF BACK ISSUES

LIVE REAL PAGE TURNING SOFTWARE

VIRTUAL ELECTRONIC MAGAZINES

FULL PDF FILE DOWNLOADS

BANNER ADVERTISEMENTS

EVENTS PAGE, LIVE LINKS

AND MUCH, MUCH MORE . . .

**SIMPLY NO
COMPARISON**

MDM Publishing Ltd, The Abbey Manor Business Centre,
The Abbey, Preston Road, Yeovil, Somerset BA20 2EN, UK
Tel: +44 (0) 1935 426 428 Fax: +44 (0) 1935 426 926

www.mdmpublishing.com

Follow Asia Pacific Fire on

facebook

LinkedIn

twitter

SEVO™ Systems announces expanded design capabilities

SEVO™ Systems Expands Design Capabilities for its Fire Suppression Systems utilizing 3M™ Novec™ 1230 Fire Protection Fluid

Utilizing 3M™ Novec™ 1230 Fire Protection Fluid, the SEVO 1230 “One to One” system is now the premier replacement for halon and HFCs in fire suppression systems. SEVO has demonstrated that its systems simplify and reduce the cost of conversion from halon 1301 to Novec 1230 fluid. The SEVO 1230 “One to One” system provides enhancements that allow even greater flexibility in design capability, for both the retrofit of halon installations as well as in new construction. In over 90% of halon or HFC retrofit cases, the existing halon 1301 piping network can be utilized, leaving only the existing halon 1301 cylinder and the existing nozzles to be replaced.

These enhancements provide benefits to designers using both the SEVO 1230 System at 500 psi (34.5 bar) and also with SEVO’s conventional 360 psi (25 bar) system. The design enhancements for SEVO’s 1230 “One to One” System increases the distance from cylinder to nozzle by 300% over other systems on the market, meaning fewer nozzles are required to meet established standards.

Only one 2½ inch nozzle is needed to cover a 16,640 cu. ft. area (500 cu. m.) versus a conventional 2 inch nozzle. These enhancements establish SEVO 1230 Systems as the only clean agent fire suppression systems on the market that provide these expanded design capabilities. The SEVO “One to One” retrofit system is the only one of its kind available for replacing halon and HFC systems with Novec 1230 fluid. All SEVO systems are approved by Factory Mutual (FM) and are UL/UL Listed.

SEVO Systems was formed in 2001 to develop and commercialize a revolutionary new technology invented and marketed by 3M that represented a major breakthrough in halon replacement technology – combining high extinguishing efficiency with excellent environmental, health and safety properties. With the highest life safety margin of any clean agent, zero ozone depletion potential, 5-day atmospheric lifetime and a global warming potential of one, Novec 1230 fluid offers the market a long-term, sustainable alternative to halon and HFCs.

SEVO worked hand-in-hand with 3M during the early development period following its discovery. SEVO represents a “safe environmental choice” and was the first OEM partner of 3M to commercialize a UL approved fire suppression system using



Novec 1230 fluid. SEVO continues to develop new application technology for use with Novec 1230 fluid, revolutionizing the industry with ground breaking approaches to sustainable fire suppression. Novec 1230 fluid is designed to balance the need for extinguishing performance, human safety and low environmental impact. 3M stands behind Novec 1230 fluid by offering an industry-leading 20-year warranty, The 3M™ Blue SkySM Warranty. For complete terms and conditions or to register your system for the Blue Sky Warranty, visit www.3M.com/novec1230fluid. **APF**

SEVO is a trademark of SEVO Systems, Inc. 3M and Novec are trademarks of 3M. Other trademarks or names may be the property of their owners.

SEVO™ SYSTEMS
Safe Environmental Choice

For further information regarding the SEVO 1230 “One to One” halon retrofit system, visit www.sevosystems.com

UNIFIRE

MANUFACTURERS OF HIGH PERFORMANCE EQUIPMENT



WHEN TIME MATTERS.
WHEN LIVES ARE AT STAKE.
WHEN SAFETY IS KEY.

CHOOSE THE BRAND
THE TOP TRAINING AND
RESCUE TEAMS CHOOSE.



UNIVENT BRAND SAWS ARE A DIVISION OF UNIFIRE

1-800-745-3282 • WWW.UNIFIREUSA.COM

Shanghai Airport's New Strikers

Shanghai Hongqiao International Airport in China has taken delivery of two OSHKOSH® Striker® 3000 aircraft rescue and firefighting vehicles. Following earlier orders from Pudong International Airport, it means there are now six Oshkosh Striker vehicles in the region.

The Oshkosh Striker 3000 offers a 6x6 all-wheel-drive axle configuration and proprietary technologies such as TAK-4® independent suspension, triple-agent firefighting capabilities and Command Zone™ advanced electronics for enhanced manoeuvrability, firefighting power and reliability. Other features include a 3,000-gallon



Oshkosh Shanghai Strikers

(11,356-litre) water capacity, 420-gallon (1590-litre) foam capacity, roof turret and six under-truck nozzles.

Hongqiao International Airport is the

first civilian airport in Shanghai and, following a series of renovations, it has become one of the three international air transit centres in China. Ninety-one airlines currently operate between the airport and other domestic and international cities. The airport's Terminal Two was opened earlier this year and a new 3.3 kilometres long runway is capable of supporting large aircraft, including the Airbus A380.

For more information go to
www.oshkoshairport.com and
www.oshkoshcorporation.com

Australian Concept Fire-Fighting Vehicle Wins National Award

A vehicle designed to help in the front-line effort against bushfires has won LIAM FERGUSON, an art and design graduate at Monash University in Melbourne, the Gold Prize in the 2010 James Dyson Award. He received the award for his Amatoya Fire Reconnaissance Vehicle.

According to the University, the Amatoya introduces a new class of fire appliance; one that is capable of reconnaissance and suppression, and the proposal may shift the way authorities approach fire fighting. Research indicates a need to develop an advanced and highly specialised light tanker. Its primary function will be as a reconnaissance vehicle, while providing unparalleled vehicle and crew safety and survivability, maintain superior off-road performance and possess appropriate fire suppression technology to provide initial response and front line defence.

The thinking behind the design is that, on arrival at any a bushfire, in order to establish the most effective means of suppression and appliance deployment, detailed and ongoing



site reconnaissance must be undertaken. In an extreme event, such as the Victorian Black Saturday fires, this task becomes exponentially critical to the survival of all crew and civilians on the fire ground. Currently the role of site reconnaissance is carried out by light tankers or Quick Attack Vehicles (QAVs). These are typically a modified single-cabin, commercial utility vehicles. While off-road performance and manoeuvrability is sufficient, the ability to actively suppress a fire threat is severely limited by the small volume of water carried and a lack of burnover protection.

Amatoya would incorporate state-of-the-art clear aerogel laminated insulation in the windows and bodywork, a dedicated auxiliary water supply to operate a highly efficient, intelligent, temperature-controlled spray down system, military-grade sacrificial thermo ceramic intumescent paints and a mechanically injected large displacement diesel engine specifically engineered for the unique conditions experienced on the fire ground.

A Remotely Operated Suppression Cannon Outfit (ROSCO) coupled with a generous

1800 litre plus 400 litre auxiliary water supply, offers a unique dynamic to vehicle operation. The ROSCO system utilises highly efficient impulse technology that not only conserves water usage, but will vitally eliminate crew members being exposed to the elements and stresses of extended high intensity work on the fire ground.

With an emphasis on crew and vehicle survivability, combined with a radically altered approach to fire suppression, the Amatoya Fire Reconnaissance Vehicle is dramatically different from any existing appliance in operation. While idealistic in its execution, this project endeavours to question the adequacy of existing appliances and suppression strategies.

The James Dyson Award was announced at Standards Australia's Australian International Design Awards held in Sydney in June. The program recognises and promotes design excellence and innovation in Australia across eight industry categories and a student category.

For more information go to
www.monash.edu.au

Fire Fighting Foam Coalition

By Tom Cortina

Fire Fighting Foam Coalition

In May 2001, AFFF and fluorosurfactant manufacturers met in Washington DC with representatives of the US Environmental Protection Agency (EPA), the US military and major foam users to discuss the fallout from 3M's decision to stop production in 2002 of PFOS-based AFFF due to environmental concerns.

It quickly became clear that users and agency staff did not fully understand the differences in chemistry between PFOS-based and telomer-based foam agents. It was also evident that speculation about the future regulation of AFFF was causing problems for the industry. As a result of this meeting, the Fire Fighting Foam Coalition Inc. (FFFC) was formed to ensure that accurate information about telomer-based foams is disseminated to appropriate audiences.

FFFC is a non-profit corporation that represents the AFFF industry's interests on all issues related to the environmental acceptability of firefighting foams. The Coalition provides a focal point for industry technical reviews, development of industry positions, and interactions with relevant organizations, such as environment agencies, militaries, approval agencies, and standards bodies. Members are AFFF manufacturers, fluorosurfactant manufacturers, and distributors.

Key messages

In order to clarify the differences between PFOS-based and telomer-based foams, FFFC has developed the following key messages:

- Fluorosurfactant-containing foams such as AFFF are the most effective agents currently available to fight flammable liquid fires in military, industrial, aviation, and municipal applications. They provide rapid extinguishment, burn-back resistance, and protection against vapour release.
- Telomer-based fluorosurfactant foams such as AFFF, FP, and FFFP are not banned from use. We are aware of no pending legislation to regulate telomer-based fluorosurfactant foams in Europe, Canada, Japan, or the United States.
- Telomer-based AFFF agents do not contain or breakdown into PFOS (perfluorooctane sulfonate), are not made with PFOA (perfluorooctanoic acid), and contain between 30 percent and 60 percent less fluorine than PFOS-based AFFF.
- The C6-based fluorosurfactants that have been the predominant fluorochemicals used in telomer-based AFFF for the last 25 years are low in toxicity and not considered to be bioaccumulative or biopersistent.
- New products based on C6 telomer chemistry are currently being developed and introduced around the world because they are considered to be safer for the environment than C8 and above. Fluorochemical manufacturers are voluntarily working to eliminate C8 and higher homologue chemicals from products and plant emissions by 2015 under the EPA PFOA Global Stewardship Program.
- Telomer-based AFFF agents that contain greater than 95 percent C6 fluorosurfactants and meet the world's most challenging foam standards have been on the market for decades, so manufacturers are confident that the new products will retain all of the same fire suppression capabilities as existing AFFF agents.



Key activities

One of the important roles performed by FFFC is to respond to inquiries from organisations around the world as they evaluate the impact of the PFOS phase-out on foam use in their countries. FFFC has a philosophy of open and honest communication as it relates to the products that our industry manufactures. We have provided extensive information on firefighting foams to environmental agencies and armed services in the United States, Europe, Canada, China, and Australia that includes the following:

- Amount of fluorosurfactant actives used in the manufacture of AFFF in the US.
- Chemical structure of the fluorosurfactants used in major fluorotelomer-based AFFF formulations.
- Mechanics of film formation.
- Groundwater monitoring data from US military fire training areas.
- US inventory of PFOS-based and telomer-based AFFF.
- Overview of the different types of foams, the market channel for their distribution, and the environmental fate once they are used.
- Aquatic toxicity of fire fighting foams.
- Toxicity, bioaccumulation, and biopersistence potential of AFFF-type fluorosurfactants and their likely breakdown products.

FFFC has also published an AFFF environmental fact sheet, eight newsletters, and numerous journal articles on foam-related issues that are available on the web at www.ffc.org.

Moving forward

The PFOS issue had the potential to deprive firefighters of their best resource for preventing loss of life and destruction of property from flammable liquid fires – fluorosurfactant-based AFFF foams. Fortunately, telomer-based AFFF continues to be the agent of choice to protect against this threat, and manufacturers have developed enhanced foam formulations with reduced environmental impacts that can be used well into the future. One of the main reasons for this positive outcome is the work of FFFC and its member companies.

Tom Cortina is Executive Director of the Fire Fighting Foam Coalition
www.ffc.org



AFFF Foams . . .



**So everyone
will make it home
safely tonight.**

Today's advanced AFFF agents:

- Are most effective to fight flammable liquid fires.
- Provide the best extinguishment and burnback performance.
- Have minimal environmental impact.
- Have a low toxicity and biopersistence profile.
- Are approved by global regulatory agencies.

New Zealand Boosts Command & Control

The NEW ZEALAND FIRE SERVICE is boosting ability to command and control the country's hazardous chemical, biological, and radiological threats with the acquisition of 17 dual-role hazardous materials/command vehicles. They are being commissioned across the country at a rate of about one a month. Each vehicle will be strategically positioned to enable it to respond within 20 minutes in major cities – typically those with associated ports or airports – and within 60 minutes across the remainder of the country, 90 percent of the time.

According to New Zealand Fire Service National Commander, Mike Hall, this hazmat/command capability is now among the best in the world and provides New Zealand civil and emergency response agencies with a national, strategic asset. The communications and data technology on board each vehicle include a large touch-screen monitor, software to support emergency command and control decision making, capability for up to six workstations, satellite communication and a camera mounted on a 10.5-metre telescopic mast to



allow those inside the command vehicle to get a bird's eye view of the incident ground.

"These vehicles and everything they

contain, including new disposable splash suits and hazardous materials detection, identification and monitoring equipment, reflect the latest in international best practice," says Mike Hall. "Much of the design has been done by the Fire Service and the vehicles and their crews will be able to handle any chemical, biological, and radiological hazards likely to be faced by our personnel, the public or other emergency service."

He continues: "Each vehicle carries a decontamination corridor that has two lanes to allow emergency service personnel or members of the public to be processed very quickly, with full privacy and using warm soapy water. The warm water wash is a huge step forward, as it is much more effective, and safer, than cold water for many types of contamination."

These decontamination corridors are a scaled-down version of the mass decontamination processes that were developed after the World Trade Centre terrorist attacks, and New Zealand is believed to be the first country in the world to use these mass decontamination principles for a business-as-usual emergency response.

For more information go to <http://www.fire.org.nz>

MSA Launches New Multi-Gas Detector

MSA has added to its Altair® line-up of portable instruments with the introduction of the new Altair 4X Multigas Detector, driven by MSA XCell sensor technology. It is claimed to offer a number of performance advantages including a standard three-year warranty, four-year sensor life, faster response time, increased stability, and less than 60-second span calibration time.

It is compatible with the ALTAIR 4 Galaxy® Test Stand, and can incorporate optional MotionAlert™ and InstantAlert™ features.



For more information go to www.MSAnet.com

Eclipse™ Thermal Imager Gives Firefighters More Eyes On The Fire

The Bullard Eclipse is the fire service industry's first low-cost, lightweight, ultra-small, personal-issue thermal imager for every firefighter, providing each firefighter with a personal-issue thermal imager to safely navigate a fire.

The concept of multiple thermal imagers on the scene of a fire is not necessarily new. What is new is having multiple thermal imagers with the same firefighting crew. Putting more thermal imagers into the hands of trained and capable firefighters can dramatically improve the efficiency of fighting fires.

Equipping each firefighter with a thermal imager increases the speed in which a crew can travel through a fire, improves accuracy, and reduces errors in image interpretation. The innovative technology of the Eclipse makes it a perfect navigational, personal-issue thermal imager for firefighters. Weighing 680 grams, the Eclipse is ergonomically shaped to fit in the palm of a firefighter's hand. Its small and lightweight frame can be clipped to a firefighter's gear, instantly providing firefighters with a navigational thermal imaging tool at their fingertips.

Ideally, the Eclipse should be used in support of an advanced Bullard Thermal Imager. One firefighter with an advanced thermal imager for analysis along with a team of firefighters using Eclipse thermal imagers means every firefighter now has sight. Equipping each firefighter with a thermal imager means firefighters now have more "eyes" in a fire, lessening the likelihood that a firefighter will become disoriented, trapped or lost.

With the Eclipse in hand firefighters have more opportunities to spot hazards and dangers, such as increasing heat levels, structural weaknesses in the floor or ceilings, hanging electrical lines, stairs or skylights, fallen furniture and other household items. In addition, if an imager is dropped or lost, firefighters can rely on the other imagers to navigate the fire.

With more "eyes" in a fire, firefighters have more opportunities to spot various hazards and dangers, such as increasing heat levels, structural weaknesses in the floor or ceilings, hanging electrical lines, stairs or skylights, fallen furniture and other household items. In addition, if an imager is dropped or lost, firefighters can rely on the other imagers to navigate the fire.

The Bullard Eclipse is integrated with the Eclipse



Control Panel software system. Loaded right onto your desktop from a CD-Rom shipped with every Eclipse Thermal Imager, the Eclipse control panel is easy to use and provides a central point of information for everything related to your Eclipse. When you connect your Eclipse to your computer via the Eclipse data cable, the software automatically recognises each Eclipse thermal imager and can help departments manage IT inventory and serial numbers.

The in-depth training that Bullard has long been known for is now available through the Eclipse Control Panel software. Use the software system for individual or department-wide training covering thermal imaging applications, Eclipse usage and deployment.

When your Eclipse is registered with the Eclipse Control Panel software, a security feature in the Eclipse is activated, saving your user information to the imager itself. Activate and track your Eclipse warranty right through the Eclipse Control Panel. In addition, you can upgrade to an extended warranty with just a few keystrokes.

Use the Eclipse Control Panel to find answers to your questions about your Eclipse Control Panel 24 hours a day, seven days a week. Any troubleshooting information is automatically transmitted to Bullard customer service to help speed your service experience. Keep your Eclipse Thermal Imager up-to-date with the latest updates and features. Your Eclipse Control panel software can give you access to future downloadable upgrade and product upgrades.

APF

For more information go to
www.bullard.com

Pacific Helmets NZ: Transforming Integrated Eye Protection

The revolutionary One-Touch Eye Protector is the result of Pacific's drive to design safe and practical products for emergency services personnel in an increasingly demanding environment.

Pacific Helmets has always operated at the cutting edge of innovation in the head safety industry. A perfect example is the achievement of a substantial reduction in overall weight, while increasing helmet toughness and strength using Kevlar® reinforced composites. Practicality and user-friendliness are also critical. Pacific's persistence in leading innovation has resulted in the introduction of its ground-breaking One-Touch Eye Protector (EP).

The internationally patented One-Touch EP is the first of its kind in the head safety industry. Its design simplicity and ease-of-use alleviate one of a firefighter's main concerns: the reduction in dexterity that results from wearing thick gloves. Traditionally, external pull-tabs or knobs have been fitted to EPs to enable their deployment. The One-Touch EP's simple operation eliminates the need for the traditional pull-tabs and external knobs that can be fiddly and frustrating to locate and activate. The increased thickness – from 1.5mm to 2mm – of the EP offers increased protection against impact by high speed particles (HSP).

The One-Touch EP offers the following advantages:

- **Simple activation:** only a gentle upward thumb-push is needed to deploy and stow the EP.
- **Sleek design:** there is no need for pull-tabs or external knobs.
- **Ease-of-use in any situation:** operation is unaffected, even when wearing the thickest of gloves.
- **Rigidity and protection:** 2mm Polycarbonate construction offers structural rigidity and improved protection against impact by HSP.
- **Security:** stows easily and safely in place when not in use.
- **Smooth deployment:** specialised design enables smooth and gradual deployment of the EP.
- **Adjustable resting position:** the EP's height can be adjusted to fit the wearer's facial features.

Pacific's comprehensive global standards coverage

The One-Touch EP will initially replace Pacific's traditional EP in all jet-style structural fire and paramedic helmets, with progressive introduction across the wider helmet range. Pacific's helmets



are certified to all major global standards (NFPA; EN; AS/NZS); the One-Touch EP will therefore be available in every market. In Australasia, Pacific Helmets manufactures the world's only jet-style helmet range certified to AS/NZS 4067:2004 (*Structural fire-fighting helmets*), the stringent Australia/New Zealand Standard, making it the helmet range of choice in the Asia-Pacific market.

An operational demonstration video of the One-Touch EP can be seen on YouTube.

Continual improvement across our helmet range

Pacific Helmets is also pleased to announce the imminent introduction to the market of the F11 structural fire-fighting helmet with internal "bubble-style" face shield. This face shield enables the overall design of a more compact helmet with a sleeker profile, allowing fire-fighters to work fully kitted in confined spaces. The F11 will be certified to all major Structural Fire Standards. **APF**

For more information go to
www.pacifichelmets.com



Quality - Safety - Comfort

Premium Helmets for the World's Emergency Services
Helmets you can Trust for all Applications

Structural Fire
Paramedic

Bush Fire
Police

Rescue
Industrial

Tested and certified to all major global standards

AS/NZS 4067: 2004

-

EN 443: 2008
(CE & MED)

-

NFPA 1971: 2007



International

Pacific Helmets (NZ) Ltd

PH. +64 6 344 5019

E. sales@pacifichelmets.com

Australia

Pac Fire Australia

PH. 1300 73 1800

www.pacfire.com.au

www.pacifichelmets.com

Cutters Edge has "The Edge" for Fire and Rescue Cutting

Cutters Edge has been manufacturing dedicated fire rescue saws since 1984. Unlike competitors, our saws are not for construction, demolition or logging, with fire rescue labels put on them; the only market we manufacture for is the fire rescue market.

Cutters Edge dedicates itself to manufacturing only fire rescue saws, carbide chainsaw chain, diamond segmented chainsaw chain and diamond cutting discs. We manufacture three classes of saws; two based on chainsaw chassis and one based on a disc or rotary saw chassis. All three are hand-held, petrol-powered saws.

The 2100 Series MULTI-CUT® fire rescue saw comes in three engine sizes: 65.1cc, 70.1cc and 84.7cc. Each engine is designed specifically for use with Cutters Edge Carbide BULLET® chain and will cut a range of materials found at fireground and rescue scenes. The 2100 Series MULTI-CUT saw can be used for many operations including: rescue cutting, extraction, ventilation, forcible entry, storm damage, crash rescue and more. Today's 2100 Series MULTI-CUT saw has undergone 29 improvements and feature designs since its introduction in 1987. Many of these improvements were suggested by fire fighters.

In 1993 Cutters Edge introduced the BULLET chain, the first chain specifically engineered for fire rescue cutting, and it is still the only carbide chain manufactured specifically for fire rescue cutting – not just a modified wood-cutting chainsaw cutter. The BULLET's unique design and "filing action" revolutionised fire rescue cutting and is the most widely used fire rescue cutting chain in the world. It will cut a wider range of different materials and last longer than any other chainsaw chain.

The BULLET is also the safest chain. Certified test results, performed in accordance with ISO 9518 by the Swedish Test Institute, showed the BULLET chain has 67 percent less rotational kickback energy than standard chainsaw chains, and is considered an "extremely low kickback chain." The BULLET chain is capable of cutting roofing nails, joist hangers, nailing plates, flashing, light gauge sheet metal and lightweight concretes. It cuts automotive sheet metal, automotive glass, hurricane glass, bullet-proof glass, plastics, glass-fibre and many other composites, including aircraft skin, and cockpit and aircraft window glass.

The Cutters Edge guard/depth gauge is designed to provide increased safety and efficiency when using the MULTI-CUT saw. The tool-less



design allows the operator to install, adjust or remove the gauge without tools, in seconds, even with gloves on. In addition to protecting the operator from the cutting chain, the gauge can be set for specific cutting depths, preventing structural damage during roof ventilation and protecting victims during rescue cutting.

The RAM-AIR induction air filtration system has more than 211 square inches of surface area with oil-tack barrier, enabling the MULTI-CUT to run up to 12 times longer than conventional saws in high temperatures and smoke filled environments. Additionally, the RAM-AIR induction feature increases significantly the power of the engine.

Additional Features include:

- Full-wrap handle.
- One-step starting.
- Fire glove D-handle starter rope pull.
- Guard deflector.
- Chain brake – stops chain in 1/20th of a second.
- Tool-less carburettor compartment entry for fast access, inspection and maintenance.
- External side chain tension adjustment.
- Multiple function "scrench tool" attached to the saw handle.
- Large capacity petrol and bar and chain oil lubrication reservoirs.

All three MULTI-CUT saw models are available in a custom diamond plate aluminium box field Kit that contains everything needed for fire rescue cutting anywhere.

APF

For more information go to
www.cuttersedge.com



First Choice Of First Responders.

Cutters Edge Rescue Saws are designed and built to deliver 100% reliable, high performance cutting in the most demanding and extreme conditions encountered by Fire and Rescue Professionals.

SIZE MATTERS! New 2186 MULTI-CUT™ Rescue Saw

With more power than any other Fire Rescue chainsaw available and up to a 61cm bar and the D-10 Guard/Depth Gauge for safety, speed and ease of use. Equipped with the BULLET® Chain that cuts safer, faster and longer than any other carbide chain made.



Gas Powered Concrete Rescue Saw

Cuts reinforced concrete up to 41 cm thick in minutes with the GCP SealPro® Diamond Chain and powerful 101cc engine. It's fully portable, operates in any position and just one water hose needed for dust-free cutting in rescue situations.



The New Generation Rotary Saw is Here!

Rotary Rescue Saw

The CE807R Rotary Rescue Saw has a new, more powerful 80.7cc engine and a non-slip rubber Full-Wrap Handle for all position cutting. A new 4-Stage Air Filtration System, incorporating a High Performance K&N Filter as its third stage assures outstanding performance in all cutting conditions. Fully-equipped Sawing Kit is available plus Black Lightning and Black Star Diamond Cutting Blades.



Fully Equipped Sawing Kits are Available for All Three Models

Cutters Edge®
FIRE RESCUE SAWS

Tele: +1-(541) 524-9999 • Email: info@cuttersedge.com • www.cuttersedge.com



International Fire Protection Equipment Technology Conference And Exposition

Beijing, 13th to 15th October 2010

Approved by the Ministry of Science & Technology of P.R. China and Ministry of Public Security, P.R. China, CHINA FIRE 2010 – the fourteenth International Fire Protection Equipment Technology Conference and Exposition – will be ceremoniously carried out from 13th to 15th October 2010 in Beijing, organised by China Fire Protection Association.

CHINA FIRE expo is the most influential and largest international fire protection exposition in

seminars will also be held. CHINA FIRE 2010 will draw visitors from more than 70 countries and regions to attend and exchange technology for their businesses.

With the development of the social economy and the accelerating speed of city construction, the demands on fire departments are being increased every year. Rescue equipment played an important role after the Wenchuan earthquake in 2008, and the addition of all kinds of equipment

CHINA FIRE expo is not only supported by the supreme authority of the fire industry and institutions of fire production quality estimation of China, but also by many international well-known associations.

China, and had previously been held every two year since 1986. Hosted by China Fire Protection Association, from 2009 it has been held every year. CHINA FIRE expo is not only supported by the supreme authority of the fire industry and institutions of fire production quality estimation of China, but also by many international well-known associations.

CHINA FIRE 2010 has attracted more than 450 exhibitors and the exhibition area is up to 55,000 square meters. At the same time, nearly 20

and rescue apparatus in the whole country was further enlarged.

Inheriting the experience of hosting the exhibition for more than twenty years, China Fire Protection Association would like to establish this golden platform between manufactures and final users for exhibiting products, exchanging technology, seeking cooperation, and continuing with the presentation and popularity for good fire products and technology.

APF

For more information go to
www.fireexpo.cn

Spanning the Globe

ONE STOP SHOP - Pumps, Trucks, Equipment, CAFS, Water Purification Systems, Tactical Gear...



For over 100 years Darley has remained a family owned and operated business. Darley is easy to work with and has extensive worldwide experience. Dealer Inquiries Welcome. Trust us with your next order.

edarley.com



DARLEY • TRUSTED WORLDWIDE SINCE 1908

325 SPRING LAKE DR. • ITASCA, IL 60143 USA • 630-735-3500 • www.darley.com • www.edarley.com



Very Early Warning Air-sampling Smoke Detection

The sooner you know, the safer you are

- VESDA very early warning air-sampling smoke detection (ASD) provides the earliest warning of a potential fire, buying time to investigate, intervene and prevent injury, property damage or business disruption.
- Hidden sampling points provide virtually invisible fire detection to maintain aesthetics.
- Multiple alarms can be set from early warning to enable investigation to warnings for evacuation and suppression.
- High sensitivity and vertical installation of sampling pipes provides reliable detection in large, open spaces and areas of high airflow that cause smoke dilution.



Protect your irreplaceable and high-value assets

Xtralis Pty Ltd
T: +613 9936 7000 | F: +613 9936 7202
marketing-apac@xtralis.com | www.xtralis.com



Smoke Detection Safeguards China's Heritage Buildings

By George Gan

Aspirated smoke detection is now protecting several Chinese heritage sites, including the Forbidden City. It ensures early detection and offers low maintenance, an absence of false alarms, and the beauty of the buildings remains unblemished by unsightly detection devices.

Over the centuries, many magnificent Chinese heritage masterpieces have been destroyed by fire. The Qin Dynasty's Palace of Efang and mausoleum of the first Qin emperor, built nearly 2000 years ago, are examples. The world-renowned Forbidden City – the Imperial Palace of the Ming and Qing Dynasties – has been ravaged by several fires in the last few centuries and only a handful of original Ming palaces remain. These buildings and their contents are irreplaceable works of art and the Chinese State Administration of Cultural Heritage is actively encouraging their protection from fire.

Largely made from wood that has dried for centuries, these buildings are extremely flammable. Their construction is often intricate, with many wooden beams and brackets used to support a large roof. This forms a tight enclosure, making it difficult for smoke and heat to escape – any fire has the potential to cause the building to collapse and be totally lost to future generations. And this can all happen in a very short space of time,

making it essential that fires are detected early.

Not only are the buildings highly flammable, frequently their contents are as well. Wooden furniture, painted screens and curtains are ideal fuel for a fire triggered by a cigarette carelessly discarded by a tourist. Old electrical wiring, degraded insulation, incorrect usage of electrical appliances and burning candles all increase the risk of a fire.

Chinese heritage buildings are traditionally arranged in groups, with different rooms connected by covered walkways and corridors. This arrangement allows fire to spread easily to adjacent buildings, causing more widespread damage. Another factor that has to be taken into consideration is that these buildings are often in mountainous areas where water may be scarce, making it even more difficult to fight a full-blown fire.

Even if a fire is quickly extinguished, smoke and water damage could potentially ruin priceless artefacts. Traditional point smoke detectors often fail to protect such buildings, as the intricate architectural detailing can easily trap smoke in pockets



in the ceiling, preventing it from reaching the detector. On a windy day, the increased air flow in these old and draughty structures can dilute the smoke further, allowing the fire to grow much bigger and quicker before conventional point detectors go into alarm. Point detectors are also difficult to install unobtrusively, as they must face the environment they need to protect and cannot be painted. Their large white surface area often conflicts with the intricate artwork normally found in these environments.

Detection challenges

The Forbidden City is a fine and evocative example of a magnificent ancient culture and is a “living” history of Chinese culture for over a thousand years. It is an invaluable asset not only for Chinese people but also for humanity as a whole. Therefore fire protection for the buildings in the Forbidden City has an extremely high priority.

The Forbidden City is constructed mainly of timber. In such environment, early detection, appropriate response and controlling the fire size are key elements in protecting the buildings from fire damage. Hence, a reliable fire protection

system must have very early response to the fire events.

The many challenges to providing reliable fire detection for the Forbidden City buildings include:

- **Substantial fuel loads:**
 - Fire size usually increases fiercely when it is developing at the flaming stage.
 - Conventional detection technologies, such as spot-type and beam-type smoke detectors, and flame detectors can only detect fire incidents at a quick-develop or fully-develop stage.
 - Triggered by alarm signals at late stages, fire intervention, including those from fire brigade, is normally too late. Huge damage, frequently irreparable, has already occurred on both the buildings and their contents.
 - Effective fire detection as very early warning (VEW) detection, at a fire size ranging from a couple of kilowatts to 40 kW as early warning (EW) detection, is critical for effective fire protection. Usually, fire incidents at such stages can be controlled by fire portable extinguishers and/or fire hydrants on the site efficiently.
- **Dirty environment:**
 - Performance deterioration of the detection systems, which may lead to false positive alarms.
 - Detection system should be immune to such dirty environment.
- **Geometrical and environmental characteristics:**
 - Smoke dilution normally occurs due to the high ceiling, stratification in summer season, and air movement due to leakage during windy weather. All these may lead to delayed detection or negative false alarms.
 - High sensitivity detection technology is essential to overcome such challenging situations.
 - Reliable and accurately predictable detection performance is the key to setting detection thresholds in these complex environments.





Smoke means an immediate alarm.

SecuriRAS® ASD aspirating smoke detector with HD sensor

Securiton AG, Alarm and Security Systems
www.securiton.com, info@securiton.com
 A company of the Swiss Securitas Group

 **SECURITON**
 For your safety

FIRERAY® Optical Beam Smoke Detectors

Low cost, field-proven fire protection
 for large open areas



Dubai Airport, Terminal 3

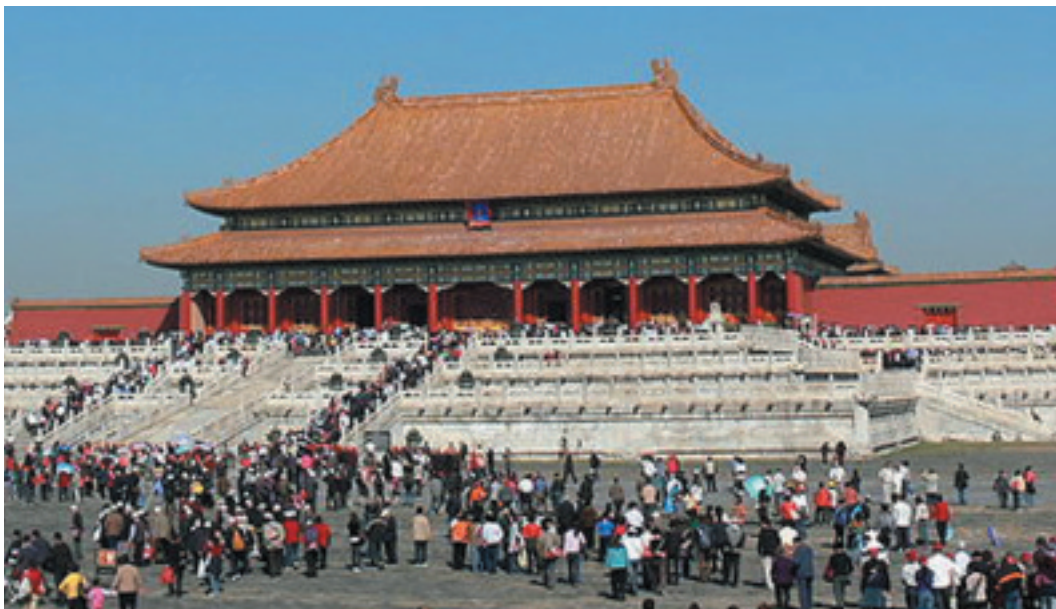
When it comes to optical beam smoke detectors no other company has the experience, or the product range, of Fire Fighting Enterprises. **FIRE**RAY® offers both reflective and end-to-end models and ATEX approved units for hazardous areas, encompassing all applications.

With over 650,000 beams installed worldwide, including in some of the world's most prestigious buildings, it is clear that the **FIRE**RAY® series is the choice for both installers and specifiers.



T +44 (0) 1462 444 740 F +44 (0) 1462 444 789 E sales@ffeuk.com W www.ffeuk.com

FIRERAY® - The leading
 light in smoke detectors



Choosing the right technology

To determine the most suitable fire detection system for the Forbidden City, Beijing Fire Protection Association and the Forbidden City Museum organised a series of in-situ fire tests that were conducted in Wenhua Palace in the Forbidden City. Participated fire detection systems included VESDA aspirated smoke detection (ASD), beam-projected detection (Beam), video smoke detection (VSD), video flame detection (VFD), and conventional spot-type detection (SD).

Four types of small-scale fire/smoke tests were conducted:

- Timber smouldering fire.
- Cotton wicks smouldering fire.
- Timber flaming fire.
- Timber smouldering fire in a ceiling void.

The fire tests were conducted in accordance with international test standards and supervised by the Forbidden City, fire authorities and representatives from the various smoke detector manufacturers.

Test results

Video smoke detection (VSD) was capable of detecting fire incidents that have a large amount of fuel (greater than ten pieces of timber sticks). However VSD was not able to detect smaller sizes of fire incidents, indicating VSDs lack of suitability for early warning detection. Furthermore, it failed to respond to flaming timber fires that generated fewer soot particles comparing with the smouldering timber fires. The results showed that VSD is not a suitable technology for reliable early detection for heritage buildings.

Video flame detection (VFD) could pick up only flaming timber fires due to its working principle. It failed in all other tests. Beam detection could not detect any fire incidents since the tests were intentionally designed to assess early warning detection capability.

Conventional spot-type smoke detection (SD) detected smouldering timber fires with large amount of fuel. In those scenarios, their response times were between one and five minutes later than those from VESDA ASD. The spot detectors failed to detect all the other wide range of fire scenarios, such as overheated cable burnings,

smouldering cotton wick fires, reduced-fuel smouldering timber fires and flaming timber fires. The spot detectors were also considered as being unable to provide an appropriate level of fire detection for the Forbidden City buildings.

VESDA ASD emerged as the clear winner in the tests, outperforming all other smoke detection technology, providing faster alarm response in all the fire tests, and consistent performance.

Aspirating smoke detection

Designed and manufactured by Xtralis, VESDA Aspirating Smoke Detection (ASD) systems are ideally suited for the protection of these environments and had already been installed in several Chinese heritage sites. Their high sensitivity and continuous air sampling capability ensures the earliest possible warning of a potential fire, while the detection points were positioned where the smoke actually went – in pockets in the ceiling or below ceiling level in buildings with very high ceilings.

The VESDA system is hundreds of times more sensitive than a traditional point detector. Even when smoke has been diluted by a draught blowing through a building, or by air conditioning, it will be detected and an alarm raised. Adjustable alarm levels allow the elimination of nuisance alarms, which is especially important in these public areas to prevent unnecessary panic among visitors.

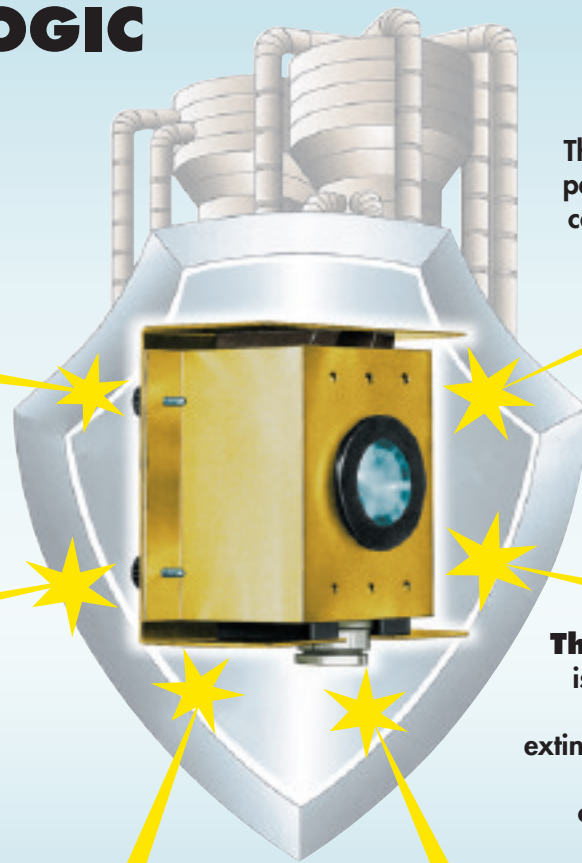
Heritage site curators have also appreciated the ability to install the VESDA system so that it is almost invisible. Instead of fixing unsightly traditional smoke detectors onto intricate carvings and paintwork, the VESDA smoke detectors have been concealed within the building, and the pipe network that brings air samples to the detector is installed on top of ceiling beams. Unobtrusive capillary tubes are then attached to draw air samples into the pipes and back to the detector. These tubes can be placed throughout the environment being protected and can be installed to provide protection of high risk items, for example, above altars. The VESDA detector and associated electronics can be hidden in a control room or in a cupboard.

APF

George Gan is Solutions Marketing Director, Fire at Xtralis. For more information go to www.xtralis.com

CONTROL LOGIC Spark detector

**designed for
dust collection
systems
to protect
storage silos
from the risk
of fire.**



**Sparks fly
at high speed.**

They travel at a hundred kilometres per hour along the ducts of the dust collection system and reach the silo in less than three seconds

The CONTROL LOGIC SPARK DETECTOR

is faster than the sparks themselves. It detects them with its highly sensitive infrared sensor, intercepts and extinguishes them in a flash. It needs no periodic inspection.

The CONTROL LOGIC system is designed for "total supervision". It verifies that sparks have been extinguished, gives prompt warning of any malfunction and, if needed, cuts off the duct and stops the fan.

ISO 9001

20137 Milano - Via Ennio, 25 - Italy
Tel.: + 39 02 5410 0818 - Fax + 39 02 5410 0764
E-mail: controllogic@controllogic.it - Web: www.controllogic.it



CONTROL LOGIC s.r.l.



**IR FLAME DETECTOR
RIV-601/FA
EXPLOSIONPROOF
ENCLOSURE**

For industrial applications indoors or outdoors where is a risk of explosion and where the explosionproof protection is required. One detector can monitor a vast area and responds immediately to the fire, yet of small size.

BETTER TO KNOW IT BEFORE

Eye is faster than nose.

In the event of live fire the IR FLAME DETECTOR responds immediately

CONTROL LOGIC IR FLAME DETECTOR

**the fastest and most effective fire alarm device
for industrial applications**

Also for

RS485 two-wire serial line



**IR FLAME DETECTOR
RIV-601/F
WATERTIGHT
IP 65 ENCLOSURE**

For industrial applications indoors or outdoors where fire can spread out rapidly due to the presence of highly inflammable materials, and where vast premises need an optical detector with a great sensitivity and large field of view.

ISO 9001

20137 Milano - Via Ennio, 25 - Italy
Tel.: + 39 02 5410 0818 - Fax + 39 02 5410 0764
E-mail: controllogic@controllogic.it - Web: www.controllogic.it



CONTROL LOGIC s.r.l.

Dynax Makes it Simple:

+ C6 Fluorosurfactants + C6 Foam Stabilizers

= BEST AR-AFFFs and AR-FFFPs for Foam Agent Producers.

You can see how it all adds up:

Dynax C6 Fluorosurfactants and C6 Foam Stabilizers . . .

- Are all non-flammable
- All have low toxicity
- None are derived from PFOA
nor do they degrade into PFOA
- All meet US EPA's 2010/15 PFOA
Stewardship Program requirements

. . . And they make it possible to
formulate 3x6, 3x3, 1x3, and 1x1
AR-AFFF and AR-FFFP agents that:

- Provide superior performance on
hydrocarbon and polar fuel fires
- Meet UL 162 and EN 1568 standards
- May not require polysaccharide gums
- Have very low viscosity

Dynax Product	Ionic Type	Agent Application Guide			
		AFFF	AR-AFFF	FFFP	AR-FFFP
Fluorosurfactants					
DX1030	Anionic	●	●	—	—
DX1040	Anionic	●	●	—	—
DX1080	Nonionic	●	●	●	●
DX1090	Nonionic	●	●	●	●
DX1025*	Anionic	●	●	—	—
DX1026*	Anionic	●	●	●	●
Foam Stabilizers					
DX5022	Anionic	—	●	—	●
DX5065**	Anionic	—	●	—	—
DX5066**	Anionic	—	●	—	●

* Blend of Fluorosurfactants

** Blend of Fluorosurfactants and Foam Stabilizers

US EPA PFOA Stewardship Program

By 2010: 95% Reduction of facility emissions and product content level of PFOA, precursor chemicals that can break down to PFOA and related higher homolog chemicals.

By 2015: Elimination of PFOA, PFOA precursors and related higher homologue chemicals from emission and products.

DYNAX CORPORATION

PO Box 285, Pound Ridge, NY 10576 USA

T 914 764 0202 techinfo@dynaxcorp.com

F 914 764 0553 www.dynaxcorp.com

dynax
FLUOROCHEMICALS



Fluorotelomer Based Foams

– Are They Safe for Continued Use?

This article aims to explain and clarify the recent scientific study into fluorotelomer-based firefighting foams and explore the relative merits of modern fluorine free foams and whether they are adequate alternatives to fluorotelomer based products. It also explores the environmental impacts of both foam types, as well as firefighter safety and waste treatment issues. This summarises the key points of a longer paper with extensive detail and referencing of the recent findings, available on our website.

By Mike Willson

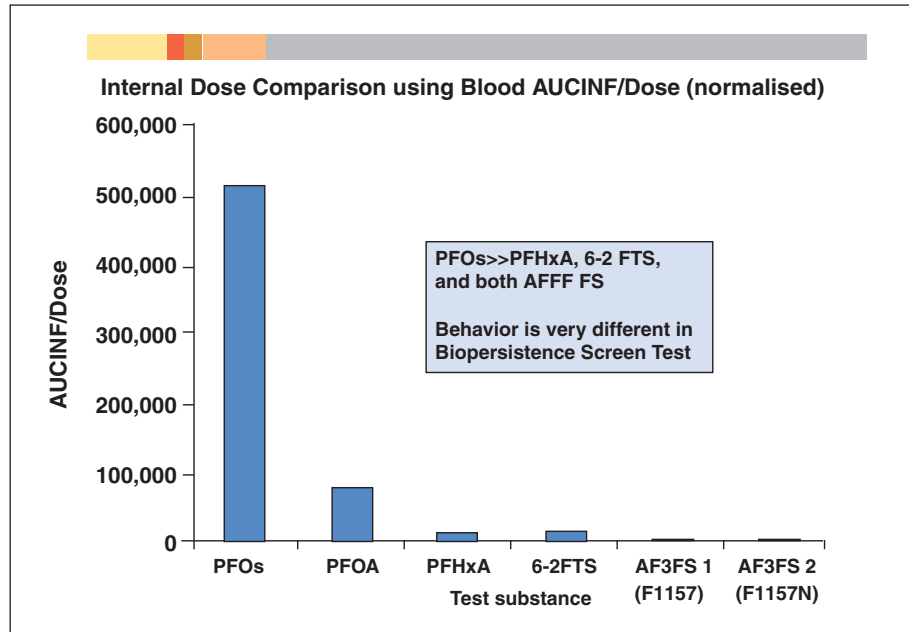
It is almost 10 years since PFOS was first accepted as a Persistent, Bioaccumulative and Toxic (PBT) ingredient in certain detergent based foam concentrates, and started being phased out of production and use in all firefighting foams. Firefighting foams containing PFOS shall cease to be used in the European Union from 28th June 2011 (EU Directive 2006/122/EC, 2006).

Firefighters around the world have been unsure whether the fluorotelomer based AFFF alternatives are safe for continued use, or whether they are better accepting the limitations of fluorine free alternatives. More evidence has been gathering to suggest that the answer is YES for continued use and that even the best efforts at fluorine free technology fall considerably short of the best fluorotelomer based products on the market, both in terms of fire performance, firefighter safety and environmental impact.

Fluorotelomer based AFFF products do not bioaccumulate and are not toxic

There is still significant scare-mongering going on about this complex subject of fluorochemicals, with some claiming that Fluorine Free Foams (F3) are the “safe alternative” as they have “no components listed as being harmful in any current or foreseeable environmental legislation”. How can anyone know that? These products are an assemblage of man-made chemicals including solvents, polymers and detergents, none of which occur naturally in nature. As with all chemicals the responsible approach is to scientifically review the position now, the likely probability into the future and make judgements in a responsible and balanced framework. This framework needs to include a full risk evaluation and analysis, product performance, environmental impacts, hazard management and firefighter safety.

Figure 1. Blood level comparison in rats for different fluorochemicals showing PFOS bioaccumulates but Fluorotelomer breakdown products and 2 commercial grade firefighting fluorosurfactants are clearly not bioaccumulative. (Courtesy Du Pont)



F3 foams have been shown to exhibit highly toxic behaviour to most aquatic organisms like fish, crustaceans, algae and bacteria. Toxicity is always a matter of concentration and while at the diluted use strength these F3 foams may not cause great detriment when relatively small quantities are used, but when the neat concentrate is inadvertently spilt into streams or ponds, or huge quantities are being used there may be a very different outcome, with long lasting and possibly permanent adverse effects on habitats and ecosystems. Who knows – maybe strict limits will be placed on the strength or quantity of detergents discharged into the environment in future, from recognition of their severe toxicity to aquatic organisms.

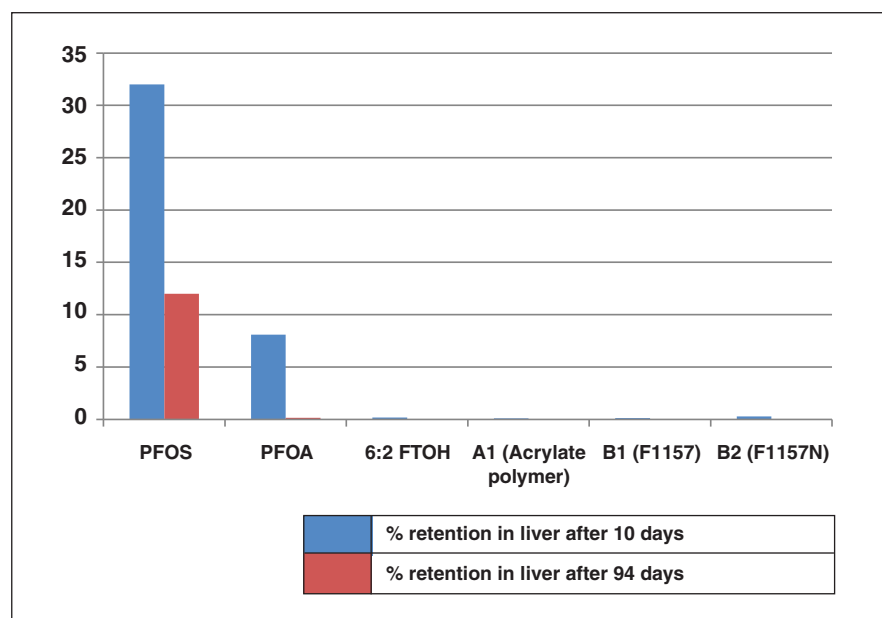
Evidence (Korzeniowski & Cortina, 2008) has shown that fluorotelomer based AFFF (Aqueous Film Forming Foam) products do not bioaccumulate in animals, do not concentrate up the food chain, are not harmful to organisms and have

been shown not to be toxic. Fluorotelomers do not break down to PFOS. Fluorotelomers used as AFFF surfactants may break down to 6:2 Fluorotelomer Sulphonate (FTS) which although is persistent, is neither bioaccumulative nor toxic.

Figure 1 clearly shows that rats fed various levels of fluorochemicals for 10 days, followed by an 84 days recovery period have significantly higher levels of PFOS in their blood. Fluorotelomers, the 6:2 FTS breakdown products and commercial fluorotelomer surfactants like F1157 & F1157N widely used in AFFF and AR-AFFF firefighting foams have significantly lower bioaccumulation or bio-persistence tendency, are radically different from PFOS, and are not bioaccumulative.

Some Fluorotelomer products do contain minute trace amounts of PFOA (PerFluoroOctanoic Acid) as an unwanted by-product from the telomerisation chemical reaction. However Du Pont has already reduced this PFOA by-product in their fluorotelomer production by ≥95%. All PFOA is

Figure 2. Rat Liver studies confirm PFOS bioaccumulates but a fluorotelomer polymer and 6:2 alcohol as well as surfactant products used in fire fighting foams show very low bioavailability potential, indicating they are not bioaccumulative. (Courtesy Du Pont)



required to be removed from the process by 2015, but best estimates suggest this will be achieved ahead of target, probably by 2012.

Global fluorotelomer production dramatically increased over 5 fold from 1985 to 2000 as it became the major rival to ECF production. However the incidence of PFOS and PFOA in human blood over this period was actually declining.

The Du Pont team conducted further research into oral toxicity and developmental toxicity of the specific 1157 fluorotelomer surfactant in rats. The No Observable Effect Level (NOEL) for both male and female rats was high and no mortality was seen even at the highest dose levels of 1,000mg/kg/day. Where high levels are tolerated, chemicals have less impact confirming that oral toxicity of fluorotelomers in mammals is low. The developmental toxin test showed similarly high results, confirming low concern.

The Ecotoxicity test showed low to moderate aquatic toxicity to fish, invertebrates and bacteria, concluding that these fluorotelomer products are of low concern (Korzeniowski, 2008) and contrast significantly with historic data for PFOS.

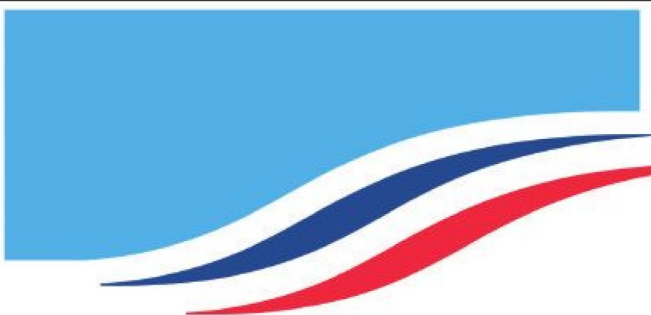
Blood is purified by the liver which screens out toxins from the body, so this is an obvious place one would expect to see fluorotelomers if they were likely to be bioaccumulative. PFOS is found there as Figure 2 clearly shows. Figure 2 is important as it is a recent study of the amount of fluorochemical found in rat livers under the same protocol as the blood tests in Figure 1.

It is interesting that the levels of fluorochemical fed to these rats were very low for PFOS (10mg/kg of body weight/day), low for PFOA (20mg/kg body weight/day) higher for 6:2 FTOH (300mg/kg of body weight/day) and very high for the A1 polymer and B1 & B2 fluorotelomer surfactants (1,000mg/kg of body weight/day). B1 & B2 are used in firefighting foam concentrates. Despite these much higher dosage levels, the A1, B1 and B2 demonstrate very low bioavailability potential as virtually no retention was found in the body at both the 10 day and 94 day periods, indicating they are not bioaccumulative. This is a radically different result from PFOS, where over 30% of the accumulated dose is retained in the body at 10 days and over 10% retention after 94 days, even though these doses were very low, confirming its positive bioaccumulative status. (Du Pont data, 2010 – manuscript submitted for scientific publication).

As you would therefore expect the latest US EPA advice confirms that *"The information that EPA has available does not indicate that the routine use of consumer (fluorotelomer) products poses a concern. At present, there are no steps that EPA recommends that consumers take to reduce exposures to PFOA,"* US EPA 2 (2009). The US EPA also has no preliminary health advisory notices for fluorotelomers, so they are considered safe for continued use. Health advisory notices are a pre-requisite for concerns over any specific chemical listed by US EPA, like PFOS which is listed.

Why are these fluorotelomers so important for firefighting?

Fluorotelomers play a vital role in modern firefighting, by helping firefighters achieve their objectives in a safe and rapid manner. They provide fast control and extinction under a diverse range of



SOLBERG

Solberg offers products of high quality and within the highest technology standards to the international fireprotection market

FIGHTING THE FIRE DRAGON



WITH CLASSIC AFFF/ATC. MODERN ORGANOHALIDES FREE FOAMS OR CLASS A FOAMS



RE-HEALING FOAM™

Organohalides free foams



ARCTIC FOAM™

AFFF/ATC foams



FIRE-BRAKE FOAM™

Class A foams

Head Office Norway	Australia / Asia
Solberg Scandinavian AS Olsvollstranda N-5938 Sæbøvågen Norway	Solberg Asia Pacific Pty Ltd 3 Charles St, St Marys, 2760, NSW Telephone (612) 9673 5300 Fax (612) 9673 5303

Emergency Stock Hotline

(Norway)
+47 976 40 000

(Asia Pacific Region)
+612 9963 3148




www.solbergfoams.com

flammable liquid applications. They help minimise spread of the fire, prevent re-ignition and reduce the amount of airborne smoke pollution. Foams containing these important fluorotelomer chemicals also protect casualties and firefighter lives, by reducing the risk of flare up, flash backs and preventing rapid escalation. Additionally they avoid the risk of boil-overs and escalation that can occur from “let it burn” policies, and ensure that minimal foam and water resources are used in any given incident. Significant asset protection is also provided by their use, reducing damage to property and investments, minimising business interruption and financial losses so the overall disruption of the fire incident is minimised.

A recent study confirmed that even the best available Fluorine Free Foams (F3) would need replenishment three times as often as good quality AFFFs, to provide the same level of fire protection. (Schaefer et al, 2007). One should also remember that no where in the world are fluorotelomer based firefighting foams prevented from use in emergencies. This is in direct contrast to the very different situation with a European ban on the use of PFOS from 28th June 2011 (EU Directive 2006/112/EC, 2006).

Are fluorine free foams (F3) really environmentally friendly?

F3 are often championed as “environmentally friendly” alternatives to fluorotelomer based foams. Others will claim they are “drop-in replacements” but their environmental profile related to biodegradability, acute toxicity, chemical oxygen demand and biological oxygen demand is in many cases significantly less environmentally responsible than fluorinated foams. Suppose all the fish in a landlocked lake were killed by a major F3 spillage, where would new fish come from to “re-set” the ecosystem balance? Realistically it could be damaged forever.

F3 rely on adding extra synthetic detergent ingredients for performance, which can lead to sudden flashbacks and dangerous situations for operational firefighters. The more volatile the fuel, like gasoline, the more fuel is likely to be picked up in the foam blanket, waiting like a time bomb to ignite. It is when the blanket begins to drain that the problems start, as fuel vapour as well as air is released above the foam blanket leading to unpredictable behaviour- from minor flaring, to major flashovers (Willson, 2007). The more forcefully it is applied to the fuel the more fuel can be picked up, so it can suddenly burst into flames and the whole blanket can breakdown within 60 seconds.

F3 products also emulsify with oil based fuels (the more detergent the more emulsification) and carry them past waste water separators, into the aquatic environment, resulting in much higher oxygen demands, toxicity to aquatic organisms and potentially major pollution incidents. Even small spillages can have significant consequences to any water source. These significant disadvantages in environmental toxicity, emulsification and sudden flashbacks, put the safety of firefighters at considerable extra and unnecessary risk.

Some foam ingredients are safer for use than others?

The fluorochemical content in foams comprises only a small part of the ingredients, typically

accounting for around 1-10%. Another 10-20% being the foam booster – glycol ethers in detergent AR-AFFFs or the more benign hexylene glycol boosters (5-10%) in the protein based AR-FFFP products. Water soluble polymers (typically below 5%), hydrocarbon surfactants (less than 10%) and water make up the balance in detergent based AR-AFFFs, while the protein based AR-FFFPs contain up to 30% hydrolysed protein, mineral salts (1-10%), and less than 5% preservative to provide long storage life.

Material Safety Data Sheets (MSDS) identify these ingredients. Most Fluorotelomer fire fighting foam products do not represent a hazard for firefighters handling the product, and they are normally diluted by a factor of almost 100 for use strength when applied to a fire.

Some F3 product MSDS have additional protective recommendations, like wearing a gas mask and ensuring ventilated conditions around the container while decanting (Solberg RF3x6 MSDS Sheet, 2007). Additional F3 hazards usually include categorisation as Hazard R51/53 defined as “*toxic to aquatic organisms and may cause long-term adverse effects in the aquatic environment*”.

F3 do have an important role to play in training and vehicle calibration, where they can mimic the induction performance of fluorinated foams and can be used in non-emergency training situations, where controls can be put in place to ensure the safety of firefighters. It is interesting that most F3 manufacturers only promote them for niche applications in recognition of their limitations for more widespread use.

Maybe fluorotelomers are not as bad as many perceive – the evidence has been building for some time and is virtually now complete to confirm this view.

Conclusions

Fluorotelomers for AFFF products are neither toxic, bioaccumulative nor biopersistent.

PFOS is proven Persistent Bioaccumulative and Toxic. Rat and fish studies conducted on 6:2 FTS breakdown products and Surfactant F1157 confirmed that fluorotelomers are neither bioaccumulative nor biopersistent. Rat studies have shown no toxicity from fluorotelomers and they are not a developmental toxin. Ecotoxicity testing concluded that fluorotelomers are of low ecotoxicity concern.

Fluorotelomers are safe for continued use.

PFOA impurity levels have already been reduced by ≥95% in fluorotelomer products and manufacturing emissions by Du Pont. The US EPA confirms that the routine use of fluorotelomer products does not pose any concern, they are safe for continued use. Other foam ingredients in these fluorinated foam concentrates are of low concern for firefighters as shown in the product’s MSDS. They are further diluted almost 100 times at normal firefighter use strength.

Fluorotelomers provide unique benefits to firefighters.

Fluorotelomers play a vital role in providing fast control and extinction of all flammable liquid fires under a diverse range of situations, minimising the spread of fire, resisting re-ignition, reducing smoke pollution, protecting casualties and keeping

firefighters safe from dangerous flare-ups and flashovers. They also prevent rapid escalation, while minimising the use of foam and water resources.

Fluorine free foams (F3) are highly toxic, emulsify with hydrocarbons and breakdown suddenly.

Championed by some as “environmentally friendly” or “safe alternatives”, F3 have been shown to be highly toxic to most aquatic organisms plus bacteria used in waste water treatment facilities. They also emulsify with hydrocarbon fuels, carry them past fuel separators into the environment causing potentially severe pollution incidents. This emulsification also occurs in the foam blanket, releasing fuel vapours above the foam layer as it begins to drain down ready to suddenly ignite if there is any incandescent material or spark nearby. They can breakdown suddenly under fire conditions, so need handling with extreme care. It would require around 50 times more AR-AFFF to be spilt in a river to kill fish, than most F3 products. Research shows F3 would need replenishment three times as often as good quality AFFFs to provide similar fire protection. When large quantities of foam are being used in major incidents this is a significant risk assessment consideration.

F3 need to be handled with extreme care.

Synthetic detergent is the most toxic ingredient in most fire fighting foams and increased levels used in fluorine free products accentuate these problems. In a large incident there may be water and concentrate supply issues, an inability to proportion the quantities of F3 concentrate required to stand any chance of extinguishing the fire. Also there are very real flashback and sudden re-ignition hazards which can put casualties and firefighters lives at risk. This is why many firefighters prefer to use as little fire fighting media as possible, so it is easier to collect, contain, dilute and dispose of through waste water treatment. A few situations are better suited to F3 products, so they do have an important role to play. Vehicle calibration and firefighter training are good examples, where controls can be put in place to contain firewater run-off and ensure adequate firefighter safety, but most manufacturers accept their practical drawbacks and promote them for niche applications only.

Benefits of latest fluorotelomer products.

The latest shorter chain (C6 and less) Capstone® fluorotelomer products retain high performance while further reducing their potential environmental impacts.

Time to make up your own mind

Each Fire Authority, industrial organisation and foam user must make up their own minds, based on their experiences, research, testing, hazards and environmentally sensitive areas to determine which products give them the best performance, flexibility, all round capability and safety for their firefighters and operational fire duties.

Most have already conducted their own evaluations and tests on both types of these foams, but these should include a rigorous burn back test to avoid any unexpected flashbacks or sudden re-ignition when you think the fire is safely

extinguished. Many have retained their commitment to fluorotelomer based foams, particularly since the science now confirms they are safe for continued use, still provide the best performance, most effective, safe and reliable method of fighting fires, and importantly remains the method for using least foam and water resources for a given sized incident. Interestingly the mood at the UK Reebok conference last July was one of realisation that fluorine free products did have serious limitations, and modern fluorotelomer based products provided the most secure, effective and safe products for firefighters to use into the foreseeable future.

Ultimately, we hope that F3 products – without the current drawbacks – will be developed. They will probably utilise new ingredients to achieve these challenging objectives. It requires a quantum shift to gain the performance we are seeking without the use of fluorotelomers, but that still seems a long way off.

APF

Mike Willson is a consultant with Willson Consulting, Australia. For further information go to willsonconsulting@yahoo.com.au



Dr. STHAMER HAMBURG

FOAM FIGHTS FIRE

NEW! STHAMEX®-ultraWet 0.1 %
Superior Wetting Agent,
Fluorine Free & Fully Bio-degradable

We offer a full range of Internationally Approved, High Performance, Environmentally Compatible Fire Fighting Foams.

24 / 7 EMERGENCY SUPPLIES PLEASE CALL +49 40 7361680

Dr. Sthamer Hamburg
Liebigstrasse 5 · 22113 Hamburg · Germany
Phone +49 40 736168-0, Fax +49 40 736168-60
E-mail: info@sthamer.com

www.sthamer.com

ONLY FIRETRACE IS FIRETRACE

OTHER TUBE-BASED SYSTEMS
CLAIM TO BE LIKE FIRETRACE.
THEY ARE NOT.

- + Only FIRETRACE INTERNATIONAL Systems offer the extensively tested Firetrace brand solutions with listings and approvals[†] from CE, FM, UL, ULC and more than 25 other international agencies on agents such as Dupont FM-200, 3M Novec 1230, CO₂, and ABC dry chemical.[†]
- + Only FIRETRACE INTERNATIONAL has 20 years of experience with more than 65,000 systems protecting equipment worldwide.
- + Only Genuine FIRETRACE SYSTEMS have the tested and proven reliability you and your customers require.

Never compromise your reputation by using impostor, untested and unapproved systems – be sure you are using genuine Firetrace.

FIRETRACE®
AUTOMATIC FIRE SUPPRESSION SYSTEMS

Call +44 (0) 1293 780390 (Europe, Middle East, Africa) or
+1 480 607 1218 (US and elsewhere) or e-mail info@firetrace.com
to see why Firetrace is the right solution for your fire protection needs.

www.firetrace.com
www.firetrace.eu



Firetrace® is a registered trademark of Firetrace USA, LLC / Firetrace Ltd. All unauthorized uses of the Firetrace trademark shall be prosecuted to the fullest extent permitted by the law.

[†] Listings and Approvals vary by system and agent.

**INSIST ON GENUINE
FIRETRACE SYSTEMS
FOR PROVEN FIRE
SUPPRESSION**





Fire Suppression for Roaring 40s' Wind Turbines



By Graham Collins

Wind turbines at the new Waterloo Wind Farm in South Australia have been equipped with dedicated fire detection and suppression systems that provide fast acting, around-the-clock fire protection. Asia Pacific Fire's Group Editor, Graham Collins, got the low-down from Bob Grieve.

While Australia comes some way down the wind energy league table, currently generating a very small proportion of the country's electricity, wind farms generating clean, renewable energy have already become a feature of the landscape in Victoria, Tasmania, South Australia and Western Australia.

Among the latest to rise out of the ground is the new the AUD \$330 million, 111 MW Waterloo Wind Farm in South Australia. It comprises 37 wind turbines and is operated by Tasmania-based Roaring 40s Renewable Energy Pty Ltd – a partnership between China Light & Power Group and Hydro Tasmania. The farm is located near the Clare Valley, about about 30 km south-east of the township of Clare and 100 km north of Adelaide on a rocky ridge surrounded by gently sloping farm land; a location that was chosen because data showed that the area's wind resource is world-class. Each of the 3 MW Vestas V90 turbines towers 80-metre above the ground and have a rotar diameter of 90 metres.

Investments on this scale, safety issues, and the environmental impact of fire-damaged or destroyed turbines has resulted in turbine manufacturers and wind farm operators becoming ever more aware of the need for effective fire detection and suppression. Indeed, it has become such an issue that several countries have developed recommendations, standards or codes of practice. According to some authoritative reports, the cost of a fire damaged turbine can be as much as AUD \$2 million.

There is also the very real and ever present risk of sparks, embers or debris from a burning turbine fire falling to the the ground and setting off a bushfire, the consequences of which have been recently highlighted by the Royal Commission enquiry into the 2009 Victoria bushfire.

So, Roaring 40s, having conducted a detailed risk assessment, turned to Brisbane-based Delta Fire Australatia Pty Ltd, one of Australia's leading high-hazard fire specialists, for a dependable fire safety solution.



Turbine fire challenge

As Delta Fire's Managing Director, Bob Grieve, explains: "A number of detection and suppression systems have been put forward as being suitable for the protection of wind turbines, but most are simply not designed for the particular fire challenges found in wind turbines."

He continues: "The most common cause of a turbine fire is a lightning strike, because these increasingly high wind turbines are invariably sited in exposed and often high-altitude locations. Mechanical failure or electrical malfunction is another culprit that accounts for a significant percentage of fires that can be fuelled by up to 750 litres of hydraulic fluid and lubricants in the nacelle, which itself is constructed from highly-flammable resin and glass fibre. Internal insulation in the nacelle can become contaminated by oil deposits, adding to the fuel load."

"Electrical equipment is another high risk area. Capacitors, transformers, generators, electrical controls and transmission equipment, all have the

potential to catch fire, as do SCADA (Supervisory Control and Data Acquisition) systems. There is also the risk of fire due to loose or broken electrical connections or the overloading of electrical circuits. Braking systems pose a particularly high fire risk. Overheating can cause hot fragments of the disc brake material to break off, rupturing hydraulic hoses and resulting in highly combustible hydraulic fluid being expelled under pressure and coming into contact with the hot disk brake fragments. Hydraulic pumps and connections have also been known to fail, allowing the fluid to erupt into flames when it comes into contact with a hot surface."

Zero tolerance specification

Working closely with Roaring 40s' management, Delta Fire devised a checklist of essential requirements for a wind turbine fire detection and suppression system.

As wind farms generally are in isolated locations, often beyond the prospect of immediate attention by the fire service, an essential requirement was that the system should deliver around-the-clock detection and suppression reliability and provide 24/7 unsupervised protection. It should also respond to a fire with 100 percent reliability, while offering the certainty of false-alarm-free operation.

Equally important was the need to stop a fire precisely where it breaks out and before it has any opportunity to take hold.

Other factors highlighted in the Waterloo Farm analysis included the need for the chosen solution to be able to contend with vibration, dust and debris, airflow through the nacelle and extreme temperature variations. It should also be intrinsically safe and require no external electrical or other power that can fail and so put the system out of operation.

"The analysis also highlighted two other considerations that, while obvious, eliminated some of the possible solutions from the final shortlist," recalls Bob Grieve. "As a wind turbine nacelle is packed with electrical equipment, it was considered to be essential that a suppressant agent was chosen that is appropriate to the fire hazard and the equipment being protected, and that, on suppression discharge, would not damage the very equipment it is there to protect."

Dedicated solution

Satisfying all of these needs precluded the vast majority of systems on the market that are purported to be suitable for micro-environment, special hazard protection and, following extensive field trials undertaken in wind turbines in Tasmania by Roaring 40s, the decision was taken to entrust the Waterloo Wind Farm turbine fire safety to Firetrace International's FIRETRACE®.

FIRETRACE is what is termed as a linear pneumatic system; one that provides both fire detection and suppression in a single, self-contained package. It is an automatic fire detection and

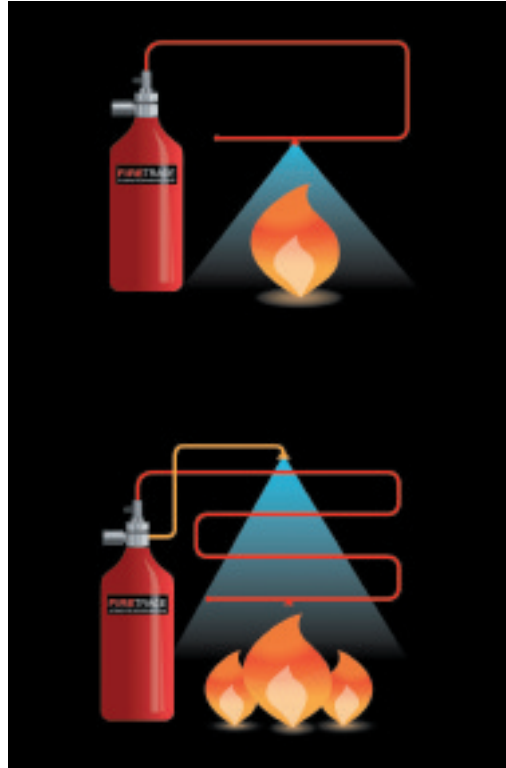
Nacelle: The nacelle sits on top of the tower and includes the gear box, low and high-speed shafts, generator, controller, and brake. A cover protects the components inside the nacelle, and the rotor attaches to the nacelle. Some nacelles are large enough for a technician to stand inside while working. The Vesta V90 turbines at the Waterloo Wind Farm each measure 9.65 metres long and are 3.85 metres wide when installed. They each weigh 70 tonnes.

suppression system that ensures fast acting, around-the-clock fire protection, requiring neither electricity nor external power; a solution that is activated without the need for manual activation or monitoring, and requires virtually no maintenance. It is an intrinsically safe solution, as it does not contain any components that produce sparks or which can hold enough energy to produce a spark of sufficient energy to cause an ignition.

FIRETRACE comprises a cylinder that, for the wind turbine application at the Waterloo Wind Farm contains 3M Novec 1230 Fire Protection Fluid. This was chosen from a number of suppressant options offered by Firetrace International because of its acknowledged "green" credentials and Roaring 40s' determination to adopt the best possible environmental solution. It has a negligible impact on the environment, with an insignificant global warming potential, zero ozone depleting potential and a remarkably low atmospheric lifetime of just five days.

The Novec 1230 suppressant is stored in containers as a low vapour pressure fluid that, when discharged, transmutes into a colourless and odourless gas. After discharge, the agent is dispersed through natural ventilation, leaving no residue to damage sensitive electrical equipment; it is also non-conductive and non-corrosive.

The Novec 1230-filled cylinder is attached to a purpose-designed proprietary Firetrace Detection Tubing via a custom-engineered valve. This leak-resistant polymer tubing is a linear pneumatic heat and flame detector that is designed to deliver the desired temperature-sensitive detection and delivery characteristics. It is routed throughout the areas to be protected and, when the tubing is exposed to heat and radiant energy from a fire, it ruptures and instantly directs the suppression agent at the source of the fire.



cabinets, while an indirect discharge system with two 35lb cylinders was selected for each turbine's transformer room.

In the Firetrace Direct Release System protecting the three electrical cabinets in the 3 MW Vestas V90 turbines, the Firetrace Detection Tubing acts as both the detection device and the suppressant delivery system. When the tube ruptures it forms an effective spray nozzle that releases the entire

There are over 150,000 FIRETRACE systems installed around the world, and the fact is that the only thing that will rupture the system's tube is heat or flame from a fire, so there is no prospect of false alarms; yet, if a fire breaks out, the response is unerringly immediate and accurately targeted.

A key factor in its success in protecting micro-environments around the world – there are over 150,000 FIRETRACE systems installed around the world – is the system's reliability. The fact is that the only thing that will rupture the tube is heat or flame from a fire, so there is no prospect of false alarms; yet, if a fire breaks out, the response is unerringly immediate and accurately targeted. It is the only UL [Underwriters Laboratories] listed, FM [Factory Mutual] approved tube-operated system in the world that is tested as an automatic fire detection and suppression system.

Waterloo Installations

The Waterloo Wind Farm fire suppression systems supplied and installed by Delta Fire comprised a single 5lb cylinder, direct-discharge FIRETRACE system to protect each turbine's three electrical

contents of the cylinder to suppress the fire in whichever cabinet the fire breaks out.

The Firetrace Indirect Release System protecting the transformer room uses the tube as a detection and system activation device, but not for the agent discharge. The rupturing of the tube brings about a drop of pressure causing the indirect valve to activate. This diverts flow from the Firetrace Detection Tubing and the agent is discharged from the cylinder through diffuser nozzles, flooding the entire transformer compartment.

The Danish-manufactured turbines were delivered to Roaring 40s at Port Adelaide, where Delta Fire fitted the FIRETRACE systems before they were transported by road to Claire Valley. The FIRETRACE installation in each turbine took 24 man hours, and the final commissioning of the systems took place once the turbines were erected on site.

APF

Bob Grieve is Managing Director of Delta Fire Australasia Pty Ltd, the authorised FIRETRACE distributor for Australasia. www.deltafire.com.au Further details on Firetrace International's FIRETRACE can be found at www.firetrace.com



IFSECINDIA

23 - 25 November 2010
BEC, Mumbai, India

Co-Located Events



FIREXINDIA
23 - 25 November 2010
BEC, Mumbai / India



**HOMELAND
SECURITY
INDIA 2010**

India's largest International Exhibition for Commercial, Homeland Security & Fire Technology

- ✓ 220 Exhibitors from 21 Countries
- ✓ 11447 Visitors from 20 Countries
- ✓ Country pavilions from U.S., China & Taiwan
- ✓ Spread Over 15000 sqm Area
- ✓ Re-Booking of Space received from majority of exhibitors of IFSEC India- 2009

*Booking opens now
for the most awaited event
for Security and
Fire Professional -
Book Now !*

www.ifsecindia.com



For further details & Space Booking contact:

Nigel Luke Brown

Project Director

T: +91 11 23765554

E: nigel.brown@ubm.com

Supported by



Certified by



Organised by



Media Partners



*Burnt forest near
Kinglake after Black
Saturday*



Victoria Bushfires Commission

– The Need for Change

By **David
McLoughlin**

The February 2009 bushfires in the Australian state of Victoria claimed 173 lives. The Royal Commission appointed to examine them reported on 31st July with 67 recommendations aimed at preventing any future disaster of such a magnitude.

Victorian Premier, John Brumby, announced the establishment of the Royal Commission just two days after what came to be known as the Black Saturday bushfires. A recently retired Supreme Court judge, the Hon Bernard Teague, was appointed chairman. His fellow commissioners were Ron McLeod, the former ombudsman of the Australian Capital Territory (who led an inquiry into the 2003 Canberra bushfires) and Susan Pascoe, a Victorian State Services Authority commissioner.

The commissioners embarked on what became one of the most comprehensive inquiries to date into an Australian disaster. During the 18 months leading to the 31st July report, they held 26 consultation sessions in the affected communities and received 1700 written submissions. They conducted 155 days of hearings, during which 434 witnesses appeared. These included senior members of the State's emergency services, firefighters and other emergency personnel on duty during

the fires, fire behaviour experts from Australia and abroad, plus 100 ordinary members of the public affected by the fires.

The Black Saturday fires erupted on one of the hottest days in Victoria's history. A summer heat wave saw temperatures across the State rise well above 40°C for several days. A long drought meant the State's forests and grasslands were tinder dry. Hot northerly winds gusted above 100 kilometres an hour for most of the day, followed by a blustery south-west wind change in the early evening.

The authorities issued strong public warnings in the days before 7th February that the bushfire danger that Saturday would be among the worst experienced. Such warnings are intended to alert Victorians living in fire-prone areas to enact their "fire plan." Under this "prepare, stay-and-defend or leave early" policy, rural Victorians are urged to be well prepared to defend their homes from approaching bushfires, or to

BUSHFIRES

Bushfire CRC researcher and firefighter amid the ruins of the township of Kinglake



leave for a safer location well before any fire threat.

Fires broke out in many parts of the State on the day. The fierce northerly winds and dry conditions ensured a number of them quickly became uncontrollable. Some of the biggest burnt in a narrow front in a southerly direction for some hours before the south-west change arrived. The latter turned the long, narrow flanks of the fires

into wide, new fronts that raged across rural communities, catching many residents by surprise. Most of the deaths occurred in a short period after this change.

The Royal Commission scrutinised the 15 most significant fires with the aim of finding out not just what led to so many deaths, but also what emergency services' practices and policies worked and

The International
FIRE & EMERGENCY
TRAINING LEADER





TRAIN ■ SERVE ■ RESPOND

TEEX trains emergency response personnel from more than 45 countries each year. Each course can be tailored to meet your exact needs in a variety of areas.

- Municipal / Industrial Firefighting
- Industrial Emergency Response Specialist
- Hazardous Materials Response
- Search & Rescue / USAR
- Aircraft Rescue & Firefighting
- Fire & EMS Leadership
- Fire Officer / Instructor
- Marine - Shipboard Firefighting
- Oil Spill Response
- Emergency Medical Service
- Emergency Management / NIMS
- Incident Command
- LNG Emergency Response
- Assessment / Technical Assistance

Schedule these or any of our 130+ courses today.
www.teex.org/fire • 1.866.878.8900



TEXAS ENGINEERING EXTENSION SERVICE
A Member of The Texas A&M University System
201 Tower • College Station, TX 77843-7696



which failed, in order to make recommendations for improvements to prevent a repeat of Black Saturday's death toll.

"If time dims our memory, we risk repeating the mistakes of the past," the commissioners wrote in the preface of their four-volume report. "We need to learn from the experiences of Black Saturday and improve the way we prepare for and respond to bushfires."

The evidence heard by the Commission was, the report said, the most comprehensive ever assembled about the circumstances of deaths in an Australian bushfire. It thus offered an unprecedented opportunity for analysis.

The long-standing "prepare, stay-and-defend or leave early" policy – popularly called "stay-or-go" – was developed after many people died while fleeing the flames in previous bushfires, often by car, and getting trapped on the roads or outside their houses. Past research showed that well-prepared residents could defend their homes from approaching fires, shelter in their home as the fire front passed, and then go outside to put out residual flames.

On Black Saturday, 140 of the 173 fatalities were people who died either in their homes or outside but close to them. While 21 people died fleeing by road, the evidence showed many people successfully escaped by road, including several hundred who were led in a last-minute convoy by local police from the small town of Marysville, which was almost completely destroyed by a fire that killed 40 people.

The commissioners found the "stay-or-go" policy was fundamentally sound, but made a series of recommendations to enact comprehensive policies on early evacuation of residents on the days of worst fire danger and to provide emergency bushfire shelters for those who leave late.

"Looking back on the experience of 7th February, it is plain that on such days, when bushfires are likely to be ferocious, leaving well before the fire arrives is the only way of ensuring one's safety," the commissioners said.

Many other recommendations were made for ways to improve the Incident Management Teams that take charge of major fires; the more efficient use of aircraft in fighting bushfires; the safety of firefighters (one firefighter died in a mopping-up mission some days after 7th February but many firefighters had narrow escapes when the wind change arrived); upgrading Victoria's ageing electricity lines (some of the main Black Saturday fires were caused by power line failures); improved building codes for homes in bushfire-prone areas; increased use of "prescribed burning" of public forest land to reduce the amount of fuels (the worst Black Saturday fires burned in areas where no prescribed burns had occurred in many years); and the appointment of a Fire Commissioner who would be the senior operational firefighter in Victoria.

CRC task force

The Royal Commission drew significantly on the resources of Australia's Bushfire Cooperative Research Centre (CRC) during its inquiries, signing a Memorandum of Understanding with the CRC.

Bushfire CRC was established in 2003 by the fire and land management agencies in Australia and New Zealand, research partners and the

Commonwealth Government. It is the first nationally coordinated centre for bushfire research in Australia, though its funding (recently extended for three years) ends in 2013.

Bushfire CRC researchers looked at not only the circumstances of how the 173 died, but also the actions taken on the day by the many thousands of people living in the fire zone who survived. Some defended their homes successfully, others not. Some defended houses were destroyed, while some undefended houses survived.

The CRC established a task force even as many of the fires still burned. Its members – researchers from state fire agencies and research organisations – assessed more than 1300 homes, interviewed more than 600 residents, took more than 21,000 photographs and analysed the fire behaviour. As well as providing evidence for the Royal Commission, the task force has produced a huge trove of data for future research.

Super Vac SVU Blows Up a 425,000 cmh Windstorm!

The Super Vac SVU is useful in situations where a district includes large retail outlets, warehouses, public sites, tunnels, or airports. It can easily mount on trailers, skids, or trucks. Optional features include, lift, tilt, rotation, water misting and lighting. Contact your dealer for more details on "The Most Powerful PPV Available"

Scan with your iPhone, Android device, or BlackBerry to see video.

SUPER VAC
THE VENTILATION SPECIALISTS
Super Vacuum Manufacturing Co., Inc. • P.O. Box 87 • Loveland, CO 80539 USA

www.supervac.com
Tel: +970 667 5146

The Royal Commission in session in Melbourne



Some 10 witnesses were CRC researchers. Five of the seven scientists who took part on a panel discussion for the Commission on prescribed burning were CRC researchers. CRC researcher, Professor John Handmer of RMIT University, Melbourne, produced a comprehensive analysis of the circumstances of the 173 deaths.

The commissioners commended the organisation, saying they had "... benefited from extensive research conducted by the Bushfire Cooperative Research Centre ...". They recommended that the Commonwealth of Australia establish a national centre for bushfire research in collaboration with other Australian jurisdictions to support pure, applied and long-term research in the physical, biological and social sciences relevant to bushfires and to promote continuing research and scholarship in related disciplines.

"The Commission considers that a national research centre or institute is required for bushfire research," the report says in an eight-page discussion of past, present and future bushfire research. "It is obvious that governments need to invest more in bushfire research and that there is a need for a 'far more significant research effort than has been the case to date'."

A National Centre for Bushfire Research

Australia was once a leader in fire science research through institutions such as the CSIRO (Commonwealth Scientific and Industrial Research Organisation) the report says. But by the late 1980s, the country had only a handful of internationally recognised fire researchers and most of them were nearing retirement age. Funding was ad hoc, often only increasing in response to major fire events. Most fire agencies had inadequate funding to employ researchers in-house. This led to relatively uncoordinated, short-term local research, rather than research with a coordinated, strategic or national focus.

Adopting the evidence of Bushfire CRC CEO, Gary Morgan, who encouraged an increased effort into areas not covered by the CRC's research program due to limited funds and tenure, the report noted: "Overall, the Bushfire CRC has been a welcome initiative that has made gains in

re-establishing a community of researchers and a consolidated research agenda. It does not, however, meet all research needs and it is unlikely to continue in its current form. Commonwealth funding for it is due to expire in 2013. A permanent national centre for bushfire research is needed with reasonable surety of long-term funding."

Following the release of the report, the chairman of the Bushfire CRC, Len Foster, announced that the CRC would transition into a national bushfire research institute to build upon the gains of its work to date and the findings of the Royal Commission. "While Australia has fire agencies among the best in the world, we still have much to learn," Mr Foster said. "The proposed Australasian Fire Research Institute will give us the new knowledge required for community safety."

The research program of the Bushfire CRC is now focusing on issues arising from the Black Saturday fires that have been highlighted by the Royal Commission. These include communicating with bushfire-prone communities, understanding the risk of living and working in bushfire areas, managing major incidents, and understanding extreme fire behaviour and its impact on the landscape.

"It is essential that the issues raised by the Royal Commission, and the many other research and inquiries into fires in Australia, continue to be analysed over the longer term by the new institute," Mr Foster said.

Following the publication of the Commission's report, the Victorian Government announced its support in principle for 59 of the Commission's 67 recommendations, including the recommendation for a national bushfire research centre. As this article went to press, it was holding a series of community consultations on the remaining recommendations.

On 14th August, the Australian Senate Select Committee on Agricultural and Related Industries, which held an inquiry into the incidence and severity of bushfires across Australia, released a report which recommended that the Commonwealth establish a new permanent bushfire research institute at the conclusion of the current Bushfire CRC funding agreement in 2013. **APF**

David McLoughlin works at the Bushfire Cooperative Research Centre in Australia. For further information go to www.bushfirecrc.com. The Royal Commission's report is at www.royalcommission.vic.gov.au

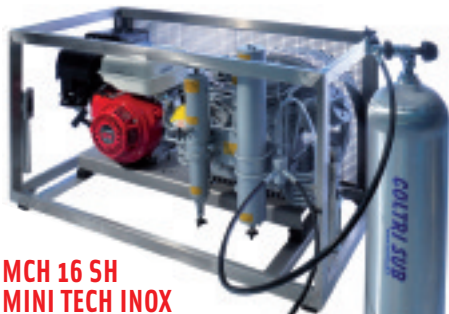


PURE BREATHING COMPRESSED AIR DEPENDABLE TECHNOLOGY



MCH 30 SILENT WITH DRIER

500 Lt/min - 18 CFM, Fully automated, Stationary filling station, The refrigerated air drier extends filtration media lifespan 6 times



MCH 16 SH MINI TECH INOX

265 Lt/min - 9.5 CFM, Light weight, Highly reliable, Portable station, Marine grade, Stainless steel frame, Also available with diesel and electric drive



MCH 6 SH

Ultraportable 100 Lt/min - 3.5 CFM, Small compressor only 37 Kg, Also available with single and triphase 3 Kw electric drive

Coltri Asia Pacific Co., Ltd.

Free Zone at 304 Industrial Park 2 No. 94/5, Moo. 3, T. Khao Hin Sorn - A. Phanomsarakarn, Chachoengsao 24120 Thailand

Tel: + 66 38 855 103 to 5 Fax: + 66 38 855 106
mobile +66 81 8913937

c.benelli@aerotecnicacoltriasiapacific.com
www.aerotecnicacoltriasiapacific.com



PROTECTING THE WORLD'S FIREFIGHTERS



Bristol - A global force in firefighter protection

Relied upon by firefighters in over 110 countries, Bristol can confidently claim to be a global leader in the specification, design and manufacture of firefighters' personal protective equipment (PPE). We deliver our world class products and support services through a network of 70 specialist distributors worldwide, while commanding a dominant share of the UK market.

Bristol Uniforms Ltd

Bristol, United Kingdom, BS16 5LL

Tel: +44 (0) 117 956 3101

enquiries@bristoluniforms.com

www.bristoluniforms.com



Making firefighting **safer!**



PAB Personal Protective Equipment

firefight series

Made of
composite fiberglass

FIRE HT 04 Composite

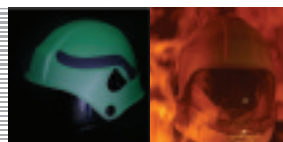
We are introducing the firefighter helmet of tomorrow. It is designed to protect the head in the most extreme conditions. Development and implementation of new composite technology in combination with established design enable full protection even at shorter (flash over flames) temperature exposures, reaching up to 1000 °C. These advantages are rounded up with extreme lightweight (1.200 g) and such design that supports a wide selection of compatible accessories. Structural firefighting has never been safer.



PAB Personal Protective Equipment
Most 26, 52420 Buzet – Croatia

tel: +385 52 662 662
fax: +385 52 662 254

info@pab-buzet.com
www.pab-buzet.com



Answering the Bushfire Royal Commission's Call



By James Eades

Early bushfire detection and real-time image mapping technology is the key to reducing future bushfire and flood devastations that loom over many governments and communities.

The 2009 Victorian Bushfires Royal Commission's final report provides a chilling summary of the fires and confusion in the days leading up to and during the worst bushfire in Australian history; the eighth deadliest bushfire/wildfire event in recorded history.

The Report highlighted the catastrophic and systematic failures of the State's inadequate response to the emergency: its failed "stay or go" policy; failures by senior emergency services officials; the lack of fire warnings to rural communities; the absence of an advanced early detection and fire mapping system; the absence of fire refuges and evacuation programs; and the poorly maintained, high-voltage power lines that sparked the Kilmore East blaze that killed 119 people.

The Report asserts that several of the Black Saturday fires were lit by arsonists; it also alleges that five of the 11 fires began because SPAusNet and Powercor, which took control of the power lines when the State Electricity Commission of Victoria was privatised in 1994, had failed to adequately maintain them; an allegation that is strongly denied by both power companies.

Both companies are now facing massive class-action law suits that could exceed AUD \$1 billion dollars in claims against them. One damning fact is that the Report also cites that: "... electricity faults spark more than 200 fires in Victoria each year ..." and warned that the number of fires caused by electrical failures will increase unless the government and the energy distribution businesses take immediate preventive steps.

This number, if correct, represents an ominous spike in electrical fault fire ignitions. Historically and statistically, faulting electrical assets represent only one percent of all bushfires started in the State, while the remaining fires are started by other causes. What is disturbing about these statistics is the number of fires being started alongside roads, which includes electrical faults. These now exceeds 47 percent of the 3500 to 4000 fires started each year. It also represents the most dangerous percentage of all fires started, as the vast majority of deaths, homes and other buildings, livestock and timber stocks destroyed in the State come from this percentage. What is worse is the fact that this percentage is preventable.

According to the Victoria Department of Sustainability and Environment, energy faults account for one percent; discarded cigarette ends are seven percents; arson attacks 25 percent; vehicles

and faulty machinery account for three percent; miscellaneous and unknown causes 11 percent with lightning being the source for the remainder.

Victoria is not alone in when it comes to electrical caused bushfires; New South Wales, South Australia and Western Australia also get their fair share – most recently, the Toodyay fires claimed 38 homes – as do other parts of the world, most notably Central and South America, China, France, Greece, Italy, Portugal, Russia and Spain. California however takes honours, with the most frequent and worst on record outside of Australia, but other States including Arizona, Florida, Nevada, New Mexico and Texas follow close behind.

The Commission's findings and suggestions that the lack of maintenance on transmission and distribution networks have significant merit. But, with vast energy networks spanning hundreds of thousands of kilometres you can not expect energy maintenance or firefighting crews to be everywhere at once. Or can you?

Technology solution

Two companies virtually a world apart began developing what has shaped up to be a very clever and credible solution; one that just so happens to answer many of the concerns and recommendation of the 2009 Victorian Bushfires Royal Commission such as faulting energy assets, bushfire and flood detection, and real-time mapping and simulation.

One is based in Melbourne, Australia; a smart energy grid and environmental sensor and communications developer called Telepathx. The other is based in Greece and is a spin-off from the National Technology University of Athens. It is a developer of crisis management software, advanced 3D fire and flood image mapping, and simulation tools that are offering governments and energy providers the ability to instantly detect, monitor and map floods, fires and faulting energy assets.

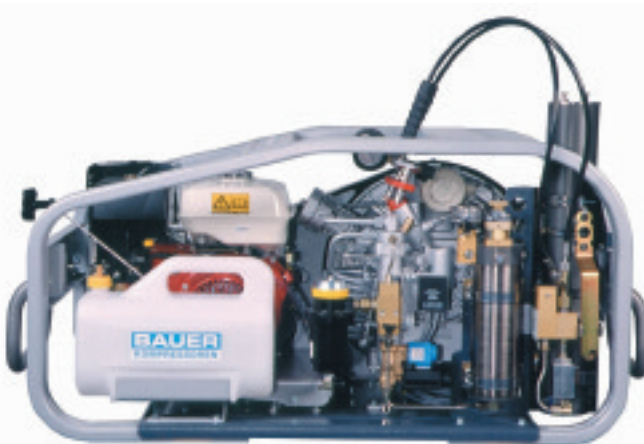
Reducing the average report time of a fire from 45 minutes to just a few minutes or even seconds would save Victorians and other communities from future devastation by bushfires. The Emergency and Essential Services Sensory Imaging Network, or EESSN for short, is a proposal to the Victorian state government to monitor up to 100,000 kilometres of State's urban and rural roads and the energy networks that parallel them. It also addresses every aspect of the 47 percent of

BAUER COMPRESSORS



Verticus 5 /KAP 5 stationary compressor

The most advance modular unit system used in fire stations with SPC-compressor control B-CONTROL, P Filter System and integrated filling panel. The unit can be upgraded to a silenced unit VERTICUS 5 type and additional filter housings, refrigeration dryer AIR-KOOL, external filling panels as well as storage cylinders can be easily fitted.



Mariner 250/320

The power pack for larger delivery of air, 250l/m and 320l/min. A newly developed, super-light aluminium chassis guarantees the best protection against corrosion! Inter- and after coolers made of stainless steel resist the toughest climatic conditions. The construction of the motor rocker stand reduces vibration for smooth operation as well as self-tensioning of the v-belt drive.

BAUER offers only Independently Tested Containment Fill Stations which were found to protect the operator from overpressure and fragmentation per NFPA 1901.

Containment Fill Stations – Stationary & Mobile

High-Pressure Breathing Air Compressors and
Auxiliary Equipment
Worldwide Sales and Service Network

BAUER COMPRESSORS ASIA PTE LTD

2 Penjuru Place, #01-05 Penjuru Tech Hub, 608783 Singapore

Tel: +(65) 6271 6271

Fax: +(65) 6272 3345

<http://www.baugroup.com>

Email: info@bauer-compressors.com.sg



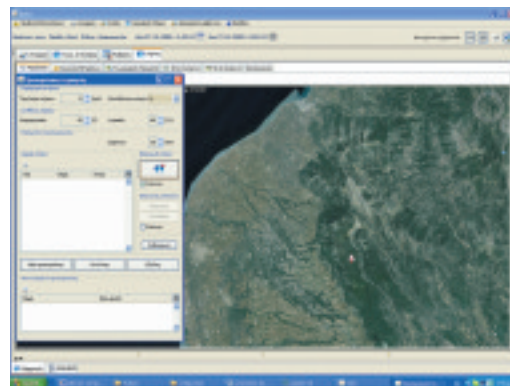
DIN EN 9601

fires mentioned earlier and is already up and running in five European cities.

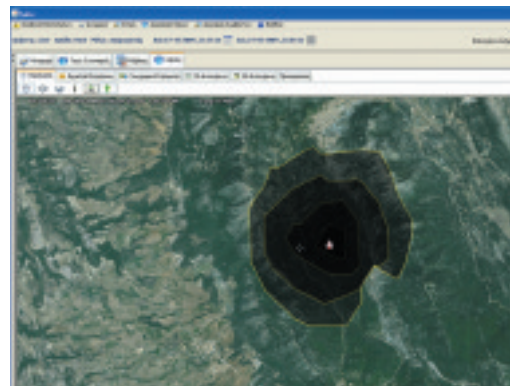


EESN is a network of more than two million tiny, disposable fire-activated, wireless sensors that would be placed under power lines that are near roads; other sensors will monitor the energy assets for faults and reduce power outages. When activated, the sensors transmit a short code to a listening device that verifies it, and then transmits its code with additional data to a command and control centre. Each device or "access point" monitors up to 80 individual sensors, is capable of monitoring an area of 6.25 hectares, and has a range of 125 metres.

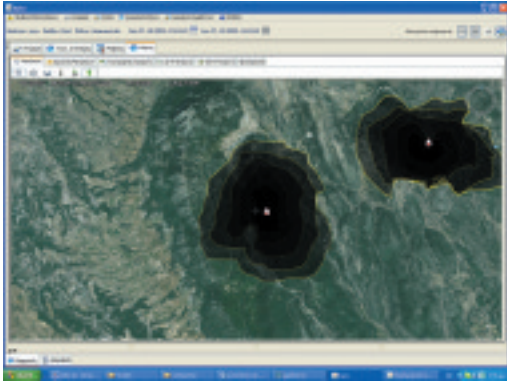
Once the code has been received by the command and control system it provides information on what kind of device is faulting, or where a fire has been detected with GPS accuracy. This GPS information is then fed into a virtual 3D GIS (Geographical Imaging System) mapping system similar to Google Earth. From here, a clear picture begins



to emerge, even before fire crews have arrived to extinguish the fire. Weather details can be inputted, such as humidity, wind speed and direction or even vegetation maps, and begin to model the fire in near real time.



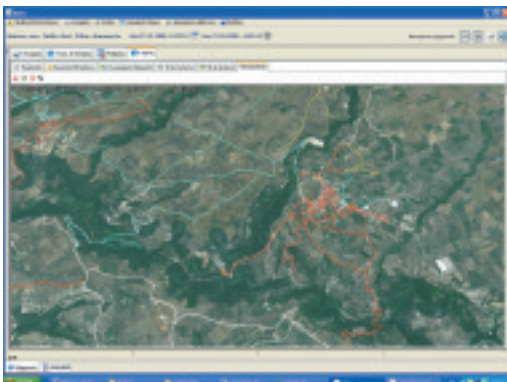
This data and image files can be sent to anyone with a mobile phone, computer or PDA (Personal Data Assistant) anywhere in the world. It will also allow command and control units in the field to manually insert spot fires started by blowing embers well ahead of the fire front. Control units can also perform this simulation weeks,



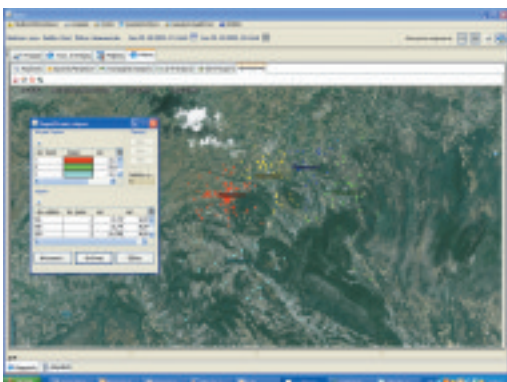
months or even years in advance without sensors, making it a great training tool for evacuation planning.

Emergency and crisis management platform

The key is providing command and control units with critical information to make timely decisions. The system can also overlay road, population maps and can display input from roadside cameras and other transport data. Allowing for real time risk assessment, evacuation and resource routing, it is an entire emergency and crisis management platform.



A new Automated Vehicle Location or AVL device being developed for fire trucks, tankers and emergency services vehicles incorporates the sensing technology. This allows command and control officers to see exactly where the vehicle is during an event and the environment it is in. More importantly they will now be able to monitor individual firefighters with very low-cost, panic- and fire-activated sensors, thereby increasing the safety of firefighters and fire fighting assets in the field.



The second phase of the EESSN will see entire communities encircled with the sensor network technology, providing advanced warning to entire communities via the internet. The system is not limited to monitoring bushfires; it can also monitor, map, model and simulate floods, chemical and oil spills, air born contaminants and pollution. The sensing platform can monitor anything and everything imaginable – bridges, culverts, signalling, lighting, gates, road conditions, structures or alarm systems.

One of the key features of this network is its ability to save lives, not only from the risk of fires and floods but also automobile accidents. The company has already developed a low cost, long term sensor that detects automobile accidents that can be embedded into fixed road-side assets such as power poles, signage, lighting, bridges and guardrails. Just like getting to the fire faster makes sense, so does reaching accident victims. **APF**

James Eades is Chairman, CEO and Principal Smart Grid Architect at Telepathx Ltd. For further information go to www.telepathx.com

FIGHT FIRE WITH FIRE

Simulation provide customised hot fire training simulators (static and transportable), designed to meet the needs of many different sectors including:

Civil Airports	Maritime	Local Authority	Military
Industrial	Training Schools	Offshore Oil & Gas	Mobile

Our highly personal approach has seen us become a simulator supplier for so many organisations, to find out how we can help you contact us on: +44 (0)1283 213395 or email info@simulation.uk.com

www.simulation.uk.com

Simulation

Bronto Skylift - Rescue Vehicles



Bronto Skylift has created reliable rescue vehicles for the fire brigades over 30 years.

Bronto Skylift offers a wide selection of rescue and fire fighting vehicles - from compact Allrounder vehicles to giant hydraulic platforms with over 100 meters working height.

BRONTO SKYLIFT OY AB

Teerivuorenkatu 28
FI-33300 TAMPERE
Finland
Tel +358 20 7927 111
Fax +358 20 7927 300
www.bronto.fi

BRONTO SKYLIFT AB

Okvistavägen 38
SE-18640 VALLENTUNA
Sweden
Tel +46 8 5816 6040
Fax +46 8 5816 6035
www.bronto.se

BRONTO SKYLIFT AG

Ifangstrasse 111
CH-8153 RÜMLANG
Switzerland
Tel +41 44 818 8040
Fax +41 44 818 8050
www.bronto.ch

BRONTO SKYLIFT GMBH

Sinkenbreite 8
DE-89180 BERGHÜLEN
Germany
Tel +49 7344 92 499 0
Fax +49 7344 92 499 50
www.bronto-skylift.de

Above all



Sydney ARFF's New Aerial Firefighting Vehicle



By Graham Collins

The new Airbus A380 is the world's largest airliner, and Sydney Airport in Australia currently handles 60 A380 movements every week, making it one of the busiest A380 airports in the world. It also presented Airservices Australia with a demanding firefighting challenge that it overcame with the addition of a new aerial fire fighting vehicle to its Sydney Airport Aviation Rescue and Fire Fighting fleet.

Airservices Australia employs 650 highly trained and experienced firefighting and technical staff that provide Aviation Rescue and Fire Fighting (ARFF) services at 21 airports around Australia. On average, Airservices firefighters are called out around 150 times a week across Australia's regional, domestic and international airports and, in the past two years, they have saved more than 20 lives.

Airservices Australia's primary roles are to rescue people and property from an aircraft that has crashed or caught fire during landing or take-off, and to control and extinguish fires and protect people and property on the airport in general. To achieve this it operates and maintains a fleet of more than 75 specialised, high-performance aviation firefighting vehicles, water rescue boats and domestic response vehicles. It also utilises the

largest firefighting vehicles in Australia – ultra-large, high visibility Rosenbauer Mk8 fire trucks, each valued at over AUD \$1 million, that can discharge almost 9000 litres of water within two minutes of arrival at an emergency.

Sydney's ARFF challenge

Sydney Airport is eight kilometres south of the city's Central Business District and is Australia's busiest airport that, in 2009, was used by 33 million passengers – an average of 90,000 passengers a day – with a total of 289,741 aircraft movements. Airservices' operation at Sydney Airport has a staff of 83 and is on call 24 hours a day. It has both a main fire station and a satellite fire station, from where the service also operates a water rescue service.

The airport is rated as Category 10 by the



International Civil Aviation Organization (ICAO); a rating that applies to all airports handling aircraft from 76 metres long up to, but not including, 90 metres, with a fuselage width of eight metres. This new mandatory standard was brought about following the introduction of the new generation of double-deck super-airliner, and is the highest category of certification created exclusively for large aircraft, such as the A380. Its introduction meant that Airservices had to re-evaluate its vehicle fleet at Sydney Airport – which handles 60 A380 movements every week – to ensure that it met the tougher safety standards.

The 555 seat, double-deck Airbus A380 has been heralded as the most ambitious civil aircraft program yet. When it entered service in 2006 it became the world's largest airliner, easily eclipsing Boeing's 747. It is 72.75 metres long, has a 79.8-metre wingspan and, of particular significance to airport firefighters and rescue teams, towers 24.08 metres above the ground. This compares with aviation's previous "giant", the Boeing 747-400's 19.41-metre height.

In the short term, Airservices Australia loaned a turntable ladder from the New South Wales Fire Brigades to meet Sydney's operational obligations under Category 10, pending arrival of a new aerial vehicle. This has now been replaced by the Airservices' own aerial specialist firefighting vehicle that was designed and manufactured to its specification by Tokyo- and Osaka-based Morita Corporation. Among the reasons cited for selecting Morita was that in excess of 95 percent of the ladder trucks and approximately 55 percent of all fire trucks currently used in Japan are believed to have been built by Morita.

High speed rescue performance

Sydney ARFF's new bright lime-coloured AUD\$820,000 Morita MLK4-30 ladder vehicle joined a fleet of specialist firefighting vehicles based at the airport. It is a high speed ASV, or Aerial Specialist Vehicle, that provides the essential safe elevated capability required when dealing with large wide-body aircraft such as the A380.

The new addition to the fleet also provides support and additional operational capability for ARFF responses to airport infrastructure fires and rescues from height. Its lightweight ladder and light body structure reduces the vehicle's gross vehicle

weight, and the superstructure is constructed on a Mitsubishi FP517LR single extra cab/chassis in a 4x2 configuration and provides seating for a crew of two.

The vehicle is fitted with a 500-litre water tank for initial supply to a Morita ME 5 pump, designed to provide easy push-button operation. This is a high- and normal-pressure pump, capable of flows of up to 2850 litres a minute, although this vehicle is not equipped to discharge foam onto flammable liquid fires, unless foam is provided to the vehicle by supporting aviation vehicles. The pump, and the unit's hydraulic oil pressure that is transmitted from an oil pump,

are powered by the vehicle's road engine through transmission-mounted power take-off.

To assist with maintaining the airport's Category 10 status, the new Morita ASV at Sydney is supported by a Domestic Response Vehicle (DRV).

Turntable operation

A key feature of the new MLK4-30 is its turntable ladder. This utilises Morita's Gyro Turntable System that incorporates an automatic vibration damper to reduce ladder swaying at heights. It is a smooth ladder stabilising mechanism that is installed on all Morita ML Series firefighting and rescue vehicles, enabling levelling by up to seven degrees.

This turntable ladder enables aerial access to approximately 30 metres above ground – nearly six metres above the top of the fuselage of an Airbus A380, and ensures that firefighters will be able to quickly and safely gain access to the upper decks of an A380 to provide assistance to passengers in an emergency. It has a maximum elevated angle of 75 degrees, and a depression from horizontal of minus 17 degrees.

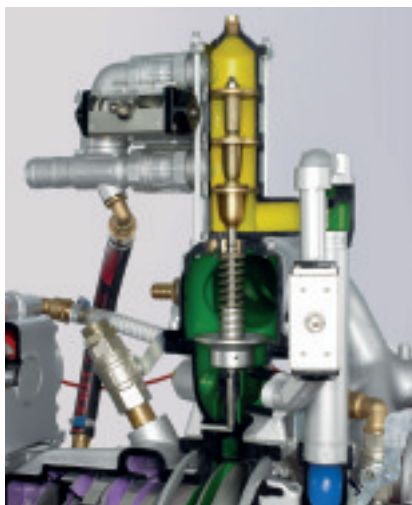
In just 20 seconds, the four-section high tensile steel extension ladder can take firefighters to a safe working height of 31.3 metres – 30 metres to the top of ladder or bottom of basket. Operations of the ladder – elevation, rotation, and extension – are controlled by levers, each of which has an independent oil pump and hydraulic line, enabling simultaneous operation of all three directional features. The outreach from the turntable's rotation centre to the top of the ladder is 23 metres with one firefighter in the basket. This reduces to 21 metres with two, 18 metres with three and 16 metres with four firefighters. The basket's total load capacity is 360 kg.

The vehicle pedestal control is equipped with a number of displays that indicate the ladder position at any time. The computerised monitoring of the vehicle position enables automatic stop, load and speed control to ensure safe operation of the ladder. Under normal operation, the fixed basket is attached to the ladder, with operational control from the basket itself. This control can, however, be overridden using the vehicle deck pedestal controls. The basket also allows a water or foam fire monitor or fire hose to be used from an elevated position for firefighting operations.

APF

Rosenbauer – competence in foam technics

Systems for municipal, industrial and airport fire services



FIXMIX

Around the pump foam proportioning systems

Simple mechanical systems, proven and tested:

- proportioning for the entire discharge range
- automatic adjustment of discharge rate to water pressure and quantity

Pump proportioning systems adjusted to the pumps:

- FIXMIX for N/NH series
- FOAMATIC A for R600
- FOAMATIC E for R600, N100

Direct injection foam proportioning systems

For highest demands

- impressive foam output
- automatic adjustment of discharge

- rate to water pressure and flow
- external suction and foam tank filling
- DIGIMATIC (with e-motor drive) for municipal use
 - 0.1 to 6%
 - 0.1 up to 22 lpm
 - (0.03 up to 5.81 USgpm)
- AQUAMATIC (with water drive) for municipal use
 - for normal- and high pressure
 - up to 24 lpm (6.34 USgpm)
- HYDROMATIC (with hydraulic drive) for industrial use



DIGIMATIC

Compressed Air Foam Systems (CAFS)

Modular systems with maximum flexibility

- POLY CAFS: small, mobile systems
- CONTI CAFS: systems with air supply via compressors
- FLASH CAFS: systems with air supply via SCBA cylinders (up to 6,000 lpm - 1,585 USgpm - water-foam mixture)



CAFS

Operation

Standard operation for all Rosenbauer systems via Rosenbauer LCS (Logic Control System)

- logical and ergonomic operation
- backlit control panel
- integrated in the pump operation panel



Pump with LCS

More useful, practical,
up-to-date information on
the Rosenbauer Group!

www.rosenbauer.com

 **rosenbauer**

When asset protection matters most. DuPont™ FM-200®

DuPont™ FM-200® clean agent can reach extinguishing levels in 10 seconds or less, stopping ordinary combustible, electrical, and flammable liquid fires before they cause significant damage. When fire is extinguished that quickly, it means less damage, lower repair costs, and an extra margin of safety for employees and valuable assets—making it easier to keep your business running smoothly.

Make sure your business is protected with the most widely specified clean agent in the world. Get maximum protection with DuPont™ FM-200®.

1.800.473.7790
cleanagents.dupont.com



DuPont Fire Extinguishants. The Science of Protection.™



The miracles of science™



By Kurt Werner

Clouds in the Forecast

For users of HFC-based fire protection systems, the future is anything but clear.

There is a lot of confusion within the fire protection industry about the ultimate impact of global policy, legislative and regulatory initiatives on HFCs (hydrofluorocarbons). Although it is quite clear there will be restrictions on, or added costs for, the continued use of HFCs in fire protection, the exact nature of the restrictions or the magnitude of the cost increases are difficult to predict.

Compared with the phase-out of ozone-depleting substances in the 1990s under the Montreal Protocol, predicting the fate of HFCs is proving to be more complex. For one thing, it appears that not all HFC markets will be affected in the same way. Substantial applications within the air conditioning, refrigeration and foam blowing sectors have no viable alternatives at this time, while others, such as fire protection, do. Either through market dynamics governed by the proposed HFC phase-down under the Montreal Protocol, in the US via Congress, or through direct regulatory measures, the fate of HFCs in fire protection is unclear. This is creating an entirely uncertain timetable for the designers, manufacturers, installers and owners of fire protection systems.

If you are using a suppression agent such as 3M™ Novec™ 1230 Fire Protection Fluid in your fixed system, you have already made a sustainable choice, and the phase-down of HFCs will not directly affect you. If not, let us take a look at some of the issues likely to impact the fire protection industry in the years to come.

Environmental concerns are at the heart of the matter, just like they were 16 years ago when HFCs were accepted as an alternative to halons and other ozone-depleting substances. Today, the widespread and growing use of HFCs as ozone depleting substance replacements, coupled with their high global warming potentials, has them targeted as a potentially significant future contributor to global warming and climate change. HFC emissions in 2050 are projected to be between nine and 19 percent of projected global CO₂ emissions in business-as-usual scenarios.

Concerns are also growing about the future impact of emissions from banked HFCs stored in equipment such as fire protection systems. It is important to note that the HFCs used as fire suppressants have higher global warming potentials than the HFCs used in other industries.



The impact of proposed climate-protection legislation on the fire protection industry is a topic of much debate. The U.S. House of Representatives last year passed the American Clean Energy and Security Act of 2009. This legislation included HFC provisions that would, through allocation and auction, phase-down the production and import of HFCs by 85 percent between 2010 and 2032. A concurrent proposal by the US, Canada, and Mexico would add HFCs to the Montreal Protocol and phase-down their production internationally by 85 percent by 2033 in developed countries and by 2043 in developing nations.

This phase-down will, over time, lead to substantially higher costs for HFCs. One concern is that the mechanisms through which HFC production allowances would be auctioned may be

premium to HFCs and already have a substantial market share. Alternatives currently being developed for other HFC sectors are likely to enter the market at costs measured in multiples rather than percentages.

It is also likely that HFC auction costs will be driven far off the legislated minimums before the large commodity markets move to the substitutes. And, as the market is intended to encourage the most effective reductions to occur first, it is possible that the fire protection market, where substitution costs are far more modest, may be the first to move. It is important to consider the possibility that the HFC phase-down supported by HFC producers may turn their commodity HFC markets back into specialty markets, but this may not be favourable for HFCs sold into fire protection.

The widespread and growing use of HFCs as ozone depleting substance replacements, coupled with their high global warming potentials, has them targeted as a potentially significant future contributor to global warming and climate change.

disproportionately unfavourable to HFCs sold into fire protection. As already noted, these HFCs have higher global warming potentials than HFCs sold into other sectors, and ultra-low global warming potential replacements are already available – unlike in many other HFC sectors. In effect, this disparity would add a higher tax at the national level on the production of HFCs for fire protection.

Not everyone agrees, however. Some suggest that market mechanisms might work in favour of HFCs produced for fire protection. They argue that low global warming potential materials will enter the commodity markets and replace hydrofluorocarbon refrigerants, which may free up lower cost production allowances for producing HFC fire suppressants.

But, arguably, the most important considerations remain the availability of HFC substitutes in large commodity sectors – relative to the proposed phase-down schedule – and their costs. Substitutes in fire protection come at a very modest

Another potential path to HFC regulation was revealed in May 2010 when the US's Environmental Protection Agency received a petition to selectively remove an HFC from the list of acceptable substitutes under its Significant New Alternatives Policy Program (SNAP), based on the availability of low global warming potential substitutes. This perhaps is a more expedient route to the regulation of HFCs, and may have a dramatic impact on HFCs sold into the fire protection sector where alternatives are also readily available for the vast majority of applications.

As the old saying goes, the only certainty is uncertainty, especially given that today's fire protection systems are intended to last well into a most uncertain future. The good news is that available alternatives to HFCs, such as Novec 1230, offer a favourable environmental profile and much greater sustainability. And choosing a sustainable alternative today could help make your future a lot less cloudy.

APF

Kurt Werner is 3M Environmental Affairs Manager. For further information go to www.3m.com

We're raising the bar.

Again.

North America
Asia
Europe
Middle East
South America

Clean Agent Fire Suppression Systems

SEVO® Systems set the bar by being the first company to design special hazards fire suppression systems with 3M™ Novec™ 1230 Fire Protection Fluid. Other companies using this environmentally sustainable solution only offer 25 bar (360psi) pre-engineered and engineered systems. We raised the bar by being the only company to offer 34.5 bar (500psi) systems. More pressure allows retrofit of existing Halon 1301 systems while utilizing conventional welded cylinders. Our True Retrofit® solution enables you to use existing piping and meet the requirements of industry standards and specifications by simply changing your cylinders and nozzles.

And again.

Our "plug and play" modular units are less costly than others and easy to install. These pre-engineered, factory-built units, with integrated detection and control, arrive pre-piped and ready to install.

And yet again.

Our mobile refilling stations for onsite refilling—available exclusively from SEVO—ensure your cylinders can be refilled within 24 hours per NFPA 2001 and other international standards. Mobile refills prevent any interruption in protection--no matter where you are located.

We're working hard at continuing to raise the bar. Would you like to learn more? Contact SEVO, the industry leader in mission-critical fire suppression technology.

SEVO  **SYSTEMS**
Safe Environmental Choice

www.sevosystems.com
Info@sevosystems.com
+1.913.677.1112



Exclusively Utilizing
3M
Novec™ 1230
Fire Protection Fluid

SEVO is a registered trademark of SEVO Systems, Inc.
3M and Novec are trademarks of 3M.

EVENT

Singapore Airlines Airbus A380 and a Korean Air Boeing 747 on the tarmac at Sydney Airport



By Graham Collins

Aviation Fire Experts To Meet In Australia

The International Aviation Fire Protection Association (IAFPA), in partnership with Airservices Australia, is holding its 13th Annual Conference in Sydney, Australia in October.

The International Aviation Fire Protection Association (IAFPA) is holding its 2010 aviation fire and security southern hemisphere conference in Sydney, Australia. The event, which is in partnership with Airservices Australia, is being held between the 5th and 7th October at the Amora Hotel Jamison in Sydney.

Under a theme of "Can We Afford to Fail?", the conference aims to conduct an intensive review of all aspects of crisis management and business continuity, looking at a number of different paradigms for successfully managing major or catastrophic events in the 21st century. It is expected to attract aviation fire safety experts from throughout the Asia Pacific region, including airport managers, senior airport, municipal, military and industrial fire and rescue emergency service management personnel, and emergency planning, risk and business continuity specialists.

Conference presenters will include: Airservices Australia, which employs 650 staff that provide aviation rescue and firefighting services at 21 airports around Australia; and Sydney Airport, where a new aerial fire fighting vehicle has recently entered service to accommodate the giant Airbus A380, the world's largest airliner (see article on page 47 of this edition of Asia Pacific Fire). Other presenters include: critical response training provider, Falck; international fire and rescue services specialist, AssetCo; Aircraft recovery company, Deschamps; Australia's Department of Infrastructure, Transport, Regional Development and Local Government; and leading firefighting foams suppliers Fomtec and Solberg.

This is the second time that Sydney has been

chosen for the event and, according to IAFPA chairman, Colin Simpson, the decision to select the city for a second time, reflects the role played by Australia and Airservices Australia in furthering airport and aviation fire safety.

The conference comes at a time when aviation safety throughout the southern hemisphere has been frequently in the headlines. In May, an Air India Express Boeing 737 overshot a hilltop airport in Mangalore in southern India and crashed into a valley, bursting into flames and killing 158. In July, an Airbus A321 with 146 passengers and six crew on board crashed in hills north of the Pakistani capital, Islamabad. There were no survivors. Most recently, a Henan Airlines aircraft, with 91 people on board, burst into flames after overshooting the runway at Yichun City's airport in north-eastern China, killing 42.

Improving aviation safety

The IAFPA was formed in 2000 to promote information exchange, study, improvements in aircraft rescue firefighting and airport facility fire protection. The Association fosters the exchange of support and technical expertise between members and international aviation regulatory agencies with the aim of enhancing all aspects of training and operational procedures dealing with aircraft rescue and airport fire protection. It works closely with other international aviation fire and aviation passenger safety organisations around the world.

IAFPA membership is open to members of airport, municipal, military and industrial fire and emergency services and aviation safety personnel.

APF



**Colin Simpson,
Chairman of the IAFPA**

For further information on
the IAFPA go to
www.iafpa.org.uk

FIRE SUPPRESSION • FIRE ALARM FIRE SOLUTIONS

**FM-200®**

Waterless clean agent
fire suppression

ECARO-25®

Cost-effective clean agent
fire suppression

PROINERT®

Inert gas system
with unique patented
flow control valve

CYBERCAT®

Comprehensive line of
intelligent fire alarm
control systems

**PRECISE® &
SIGNIFIRE™**

Event management and
Video smoke systems

**NEW
INTEGRATED
VOICE
EVACUATION**

For over 30 years, Fike has provided reliable and innovative fire protection systems. Today, Fike systems are trusted around the world. We have application experts in key regions to provide fast, responsive service. In addition to our well known clean agent product line, we offer a complete fire alarm system with the flexibility to meet a variety of application needs.

Fike®

WWW.FIKE.COM
+60-3-7859-1462

LUKAS

Because you never get a second chance



The new liberty in rescue.

LUKAS eDRAULIC – the next generation rescue tools.

Test the first full-size rescue set worldwide with an electrohydraulic drive that frees you from power units and hoses!



Experience the new liberty on www.lukas.com

LUKAS Hydraulik GmbH | Fon: +49 9131 698-0 | www.lukas.com

Holmatro Concrete
Crusher



Cut, Crush and Prop

The latest hydraulic rescue tools at Interschutz



By Graham Collins

The recent Interschutz exhibition in Leipzig, Germany saw a flurry of activity from the leading hydraulic rescue tool manufacturers. APF Editor, Graham Collins, overviews just a few of the headline-making tools.

According to the World Health Organisation, globally a staggering 1.2 million people die every year in road accidents and a further 50 million are injured. Add to this the fact that, so far this year, well over a quarter of a million people have been killed in natural disasters, and it is easy to see why there was such widespread interest shown at Interschutz on the latest hydraulic rescue equipment.

Certainly, several of the global market leaders used the show to unveil their latest developments or focus on their best-selling solutions. This included hydraulic cutters that today have enormous power and have become even more vital pieces of equipment on the rescue scene than ever before.

This is due both to advances in vehicle design and construction and improvements in cutter technology. Spreader tools also featured prominently; a powerful tool that can prove invaluable during the victim extrication process. Rams too are an essential part of the hydraulic tool set and can play a decisive role in situations where the front of the vehicle is causing entrapment of the occupants.

German manufacturer, Lucas, launched what it describes as the first complete set of rescue tools worldwide that works entirely without power units and hoses. The new line-up uses what the company calls eDRAULIC technology that is aimed at setting new standards in vehicle extrication.

With eDRAULIC electrohydraulic technology, an

RESCUE TOOLS

Lucas Cutter



ordinary power socket is all that is needed to provide the same power as a large and heavy petrol or electrical power unit. The eDRAULIC tools, which comprises a cutter, spreader and rescue ram, deliver at least as much power as hose-bound rescue tools. Thanks to modern lithium-ion batteries, the eDRAULIC series can also be used without cables – but with full power – which is a major advantage in multiple crashes or off-road work.

Since with eDRAULIC technology power units and hoses are no longer necessary, rescue teams also save space on their trucks, freeing-up room for other items of rescue equipment. The new Lucas tools are also claimed to weigh 50 percent less when compared with conventional rescue sets.

Each of the tools can be started simply by pressing a button; they are then ready immediately for

action. Changing from battery to cable operation is also quick and easy, resulting in a considerable reduction in the time between arrival at the emergency site and the start of rescue operations.

The latest introduction from Weber-Hydraulik in Germany is its new Xtreme cutter. It is being heralded as combining perfectly balanced power with unrivalled cutting performance that ensures that the materials used in modern car, bus and truck manufacture are tackled with ease.

The new hydraulic cutter incorporates forged high-performance blades with a bolt cutting recess. The cross-over, high-performance blades ensure a “perfect” move-in cut, fully utilising all the available power to complete the cutting operation. A 360 degree rotatable and detachable handle boosts its ease of handling and makes the Xtreme cutter ideal for use in restricted or confined spaces, while its lightweight construction results in Weber-Hydraulik claiming that the Xtreme cutter achieves the highest power-to-weight ratio.

Netherlands-based Holmatro unveiled a whole raft of rescue products at Interschutz. This included a number of hydraulic rescue tools including a new mini cutter, a new concrete crusher and a new ram. All utilise Holmatro’s CORE – Coaxial Rescue Equipment – technology that controls the

Rescue equipment

The power of innovation

**New from Holmatro:
The Extendo ram**

This ram saves valuable time combining manual and hydraulic extension. You simply pull it out and start spreading.

Bridge gaps quicker and with more precision than ever before!

The power of innovation

For more information about the Extendo ram and other new Holmatro products, see www.holmatro.com/rescue

www.holmatro.com

Holmatro Rescue Equipment BV | The Netherlands
T +31 (0)162-589200 | F +31 (0)162-522482 | E rescue@holmatro.com

holmatro
mastering power

way in which hydraulic oil is directed from the pump to the tool and vice versa.

The new Holmatro Mini cutter CU 4007 (C) is suitable for both round and flat profiles. It is designed for applications such as cutting car pedals and head restraints in vehicle accidents, and cutting reinforcement bar in urban search and rescue operations. Its ease of use in confined spaces is thanks to its extremely compact design and push-button, one-handed operation. It is the ideal tool to use alongside the new Holmatro mobile concrete crusher, which is engineered to break up large, thick chunks of concrete – up to 230mm thick – to provide access into collapsed structures following an earthquake or explosion.

The company's new Extendo ram XR 4360 (C) offers both manual and hydraulic extension, saving valuable time when every second counts. Manual extension enables quicker and more precise positioning, allowing spreading to start almost immediately.

Like all of the leading suppliers, Germany's Lancier Hydrauliks took the opportunity to show a broad spectrum of its hydraulic rescue equipment. Its hydraulic cutting equipment on display, for example, featured a selection of cutting tools with different blade openings up to 250 mm and blades – that are exchangeable and can be re-ground – with a cutting force up to 1102 kN.

The company's spreaders also featured prominently. Manufactured from high-strength yet lightweight metal alloy, they boast spreading widths up to 820mm and spreading forces up to 694 kN. Lancier's uniquely designed combination cutter and spreader has the potential to reduce the number of items of equipment carried by rescue vehicles. These have a spreading width up to 460mm and a cutting force of up to 729 kN.

In the final analysis, of course, each rescue tool has its own unique benefits and these have to be matched against the type of incidents and their probable locations the purchasing fire and rescue service is most likely to have to face. It is all a matter of having the right tool, at the right time, at the right place. We are fortunate to have such a wide choice of equipment available but we should never forget just how lucky we are to also have the skilled and dedicated people to use them. **APF**



Holmatro Extendo Ram

bio-ex advanced quality

1 Ton
of AFFF

10 kg
of fluorosurfactants (PFC)

2 Million M3
of contaminated water

FLUORINE FREE Foam
The alternative

www.bio-ex.com

STINGER[®] + WIRELESS ELECTRONIC TECHNOLOGY

STINGER RF... YOUR BEST LINE OF DEFENSE

New Stinger RF delivers big water in hazmat and other tough situations where you can't take a vehicle and won't send a firefighter. Stinger RF goes from truck mount to portable in seconds, and you can control it from 1/4 mile away with a hand-held or panel-mount remote. Get in. Get out. Play it safe. Let's talk. Call 1-800-346-0250.



Elkhart Brass
Fire Fighting Equipment

The Most Experienced Manufacturer of Fire Fighting Equipment

Elkhart Brass Mfg. Co., Inc. | 1-574-295-8330 | 1-800-346-0250 | www.elkhartbrass.com





Compressed Air Foam

– What's It All About?



By **Keith Klassen**

The use of Class A compressed air foam as a tool for both fire suppression and exposure protection is steadily increasing. Fire departments are learning more about how and why to use compressed air foam (CAF) and finding that it is appropriate for numerous tactical applications.

In this article we will look at how foam is made, how compressed air foam systems (CAFS) work, some applications for CAFS, and what is new in Class A foam and CAFS.

The purpose for using Class A foam is to make water a more efficient fire extinguishing agent. Class A foam concentrate is simply a high grade synthetic detergent that, when added to water detergent, improves water's ability to fight fire in two ways. First and most importantly, it reduces the surface tension of the water allowing it to spread into a thin sheet. This provides more surface area, allowing the same quantity of water to absorb more heat. Second the detergent is attracted to carbon, thereby making the water carbon-loving. This characteristic makes the water attracted to Class A fuels, which are carbon based.

The water will stay in contact with burning fuels longer providing more cooling; it will also be more easily absorbed into the fuels providing increased fuel moistures for protection of exposures.

In order to make finished foam bubbles, four components are required. These comprise the foam tetrahedron. They are water, foam concentrate, air and agitation.

When water and foam concentrate are mixed they form a foam solution. Class A foam concentrates are 1 percent concentrates, meaning that they will be mixed with water in percentages of 0.1 percent to 1.0 percent. The starting percentage for compressed foam systems is only 0.2 percent to 0.3 percent. This is due to the fact that CAFS is a more efficient way to produce finished foam bubbles. Air is then mixed with the foam



solution to form the actual finished foam bubbles.

There must be agitation to force the mixing and form the bubbles, and the most efficient way to create agitation is a compressed air foam system. In the system, air under pressure is injected into the foam solution as it leaves the discharge of the apparatus. The agitation takes place in the fire hose and, as the mixture moves through the hose, it tumbles and scrubs on the inside liner of the hose creating bubbles. CAFS is capable of producing very fine equally sized bubbles that provide the maximum amount of surface area for a given volume of water and therefore the maximum heat absorbing ability.

If the pressures are not balanced, the product with the higher pressure will override and the mixture in the hose will be incorrect. In most systems the air is the last product injected and is added to each individual discharge separately. This is done to provide full control over the foam being produced and to allow individual discharges to operate in different modes at the same time.

Most systems can operate in four modes. They are water only, foam solution, air only, or compressed air foam. Water can be flowed at any time through discharges not connected to the foam manifold, or through foam manifold discharges when the foam proportioner is turned off. Foam

The simplest way to think of a compressed air foam system is as three separate pumps tied together. They are: a water pump, standard to any pumping fire apparatus; a foam pump typically called a proportioner; and an air pump commonly referred to as the air compressor.

The simplest way to think of a compressed air foam system is as three separate pumps tied together. They are: a water pump, standard to any pumping fire apparatus; a foam pump typically called a proportioner; and an air pump commonly referred to as the air compressor. In order for these pumps to work properly together there must be check valves to keep the water, concentrate, and air in the proper place. For example, air in the water pump can cause cavitation and water can destroy an air compressor.

There must also be an auto balance system. Its job is to keep the air and water pressures balanced. This is important as both air and foam solutions are being added to the same hose line.

solution can be provided for a standard firefighting or aspirating nozzle through discharges plumbed off the foam manifold by opening the discharge water valve with the proportioner turned on. Air only can be provided for operating air tools or air bags, inflating tires, or charging hose lines with air. This is done by closing the discharge water valve and opening the air valve. Some systems also have an auxiliary air discharge on the pump panel.

CAFS applications

Compressed air foam is made by opening both the water and air discharge valves. The consistency of the foam can be adjusted simply by controlling the

amount the water discharge is opened. The farther the valve is opened, the more foam solution will enter the line, displacing a portion of the air that is also entering the line. In general, there are two different consistencies of finished foam which are used. The first is wet foam, which is wet and sloppy with the consistency of melted ice cream. Its proportions are approximately 7.6 litres of water to 0.028 cubic metres of air. The total volume of liquid pumped will be determined by the size of the hose line being used.

Wet CAF is used in most applications, and is appropriate any time there is heat, flame or smoke showing. It can be used effectively for both fire attack and for mop-up and overhaul operations.

The second product is fluid foam, which has the consistency of shaving cream. Its proportions are completely opposite: about 3.8 litres of water to 0.08 cubic litres or 0.11 cubic litres of air. Because of the low water volume, this product is not appropriate for fire extinguishment. It is used specifically for protecting exposures, as it is capable of providing an insulating reflective blanket.

There are many reasons to use compressed air foam. The importance of each will vary depending on a particular fire department's organisation, staffing levels, equipment, and target hazards.

gator to examine. The lower total volume of water applied also leaves the evidence in place.

- **Environmental impacts:**

Lower volumes of water used also means that less fire debris is washed out into the environment. The use of foam to create fire lines in wildland scenarios can be more ecologically friendly, as opposed to creating the line with heavy equipment.

The applications for compressed air foam vary widely. In the wildland arena, they include direct fire attack, creation of indirect fire lines, mop-up and overhaul and exposure protection. In the wildland urban interface, foam is used extensively for both fire attack and structure protection. Compressed air foam works exceptionally well in extinguishing and overhauling vehicle fires. In structural firefighting CAF is highly effective when used both for exterior and interior attacks as well as for fire overhaul.

Latest developments

Recent technical developments in compressed air foam systems have concentrated on making the systems more accurate and firefighter friendly. The use of an auto tank fill device manages the water tank level automatically when the apparatus is

Recent technical developments in compressed air foam systems have concentrated on making the systems more accurate and firefighter friendly. The use of an auto tank fill device manages the water tank level automatically when the apparatus is hooked to a water supply and makes it easier for the operator of the CAFS to maintain consistent operations.

- **Firefighter safety:**

Because CAF is more efficient, it allows firefighters to extinguish the fire quicker, thereby being exposed to the situation for a shorter period of time. The high energy of a CAF stream provides a longer reach, allowing firefighters to operate farther away from the incident in a safer location.

- **Limited manpower:**

Compressed air foam does not replace manpower; people are still needed to perform fire ground operations. It does though allow the first arriving firefighters to do more in the first few minutes of the incident, which in turn positively affects the remainder of the incident and the total time at the fire scene.

- **Limited water supply:**

When water supply is limited the use of foam extends the capability of the water supply.

- **Wildland urban interface:**

Compressed air foam is very effective when used to protect homes and other property that are exposures in interface situations. Structures can be protected with a layer of foam and firefighters can move to a safe area before the fire arrives.

- **Improved fire investigation:**

Because foam is capable of quickly extinguishing the fire, more evidence is left for the investi-

gator to examine. The lower total volume of water applied also leaves the evidence in place. This reduces the slip-and-fall hazard for personnel.

The foam proportioning systems from Waterous, for example, are now capable of sensing not only water flow but also water temperature and conductivity. These increased sensing capabilities make the system more accurate and help mitigate variables such as water and foam concentrate quality, providing a more consistent foam product. Elkhart Brass and Waterous have also developed the Intelligent CAFS Selector (ICS) valve that is used to control the discharge water and air valves on a CAFS. The ICS provides three preset positions, but still allows for full operator control to make adjustments to the foam as needed. This valve allows the system to be put into operation quickly, accurately, and with repeatability.

Over the years compressed air foam systems have developed from rudimentary machines into sophisticated firefighting systems. This, combined with the increased knowledge of their use and capability, will make them an ever expanding tool in today's fire service.

APF

Keith Klassen is Waterous CAFS Instructional Program Manager. For more information go to www.waterous.com

Foam Concentrates and Foam Systems for all applications





Fighting Fires With Thermal Imaging

By Bullard
Asia Pacific

Firefighters used to search burning buildings on their hands and knees, racing against time to find unconscious victims. Today, with the help of thermal imaging technology, firefighters now see through smoke, cutting their search time by more than half and increasing the chances victims will survive.

Thermal imaging technology was originally designed for the military in the 1950s and 1960s. It was developed to aid military personnel during night missions and across smoke-covered battle fields. The thermal imaging technology that worked so well for the military was soon applied to other applications, including the fire service market.

There is a wide variety of thermal imagers available for fire departments. From advanced thermal imagers with ultra-high resolution detectors, advanced colourisation, enhanced image clarity and picture definition, to a low-cost, lightweight, navigational personal-issue imager that clips to a firefighter's gear. Thermal imagers have become a necessary tool for fire departments.

Thermal imaging technology

All objects have a certain temperature and emit waves of energy called infrared radiation. The hotter an object, the more energy waves are

emitted. A thermal imager translates these energy waves into a viewable image that displays a "heat picture" of a scene. On the screen of a thermal imager, hottest objects show as white, coolest objects show as black, and features of other objects show as varying shades of gray.

Since infrared radiation is not blocked by smoke, firefighters can use thermal imagers to see clearly through smoke, which the human eye cannot. This "thermal picture" enables firefighters to find victims faster, identify the source of the fire earlier, and detect structural dangers that put firefighters at risk. One of the great things about thermal imagers is that they are fairly easy to understand; just turn them on, look at the display and the world does not look much different. As you look around the fire house without your thermal imager you see a couch, a television, a table, a bookshelf, and a table. If you looked around the room using only a thermal imager, you would see a couch, a television, a table, a



argus[®] 4
thermal imaging from e2v

A test of courage...

...and image quality, durability, reliability, performance, image capture...

The Argus4 Thermal Imaging Cameras and find out for yourself why it's proven to be the best TIC in its class. Thousands of fire departments around the world rely on the technologically superior Argus4 to save lives and protect their own.

The Argus4 is designed specifically for firefighters. Its high resolution detector, crystal-clear display screen, and up to x4 zoom ensure maximum

visibility in any situation. It's also extremely light at just 3lbs but not at the expense of its strength. The Argus4 is one of the toughest cameras out there, withstanding extreme temperatures thanks to its rugged and durable casing. And with SceneSave image capture for up to 100 images, plus spot and ambient temperature detection, the Argus4 really can give you the courage you need to do your job.



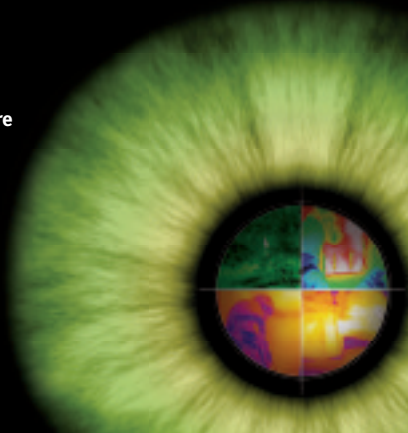
argus[®] LRT
thermal imaging from e2v

See the BIGGER picture

Argus Long Range Telemetry

Argus LRT transmits clear, secure thermal video footage to on-scene commanders. From tower blocks to subterranean tunnels, this accessory to Argus cameras gets a better view of the situation.

- Designed using COFDM technology for a secure transmission
- Noise-free quality picture
- Up to 1km range
- Integrated into camera battery



For more information or to book a demonstration please go to
www.argusdirect.com

bookshelf, and a table. Not too complicated.

Thermal imagers cannot see through walls, glass or other solid objects, but they can detect heat that has transferred to the surface of an object. The imager's detector receives electromagnetic energy and converts it into an image. Using this technology, firefighters can see heat signatures as small as footprints or handprints. Thermal radiation is simply a portion of the electromagnetic spectrum. The electromagnetic spectrum describes radiation in terms of energy. Higher energy creates shorter wavelengths and improves penetration, while lower energy produces much larger wavelengths and improves distance.

Firefighter safety

There is little doubt that thermal imagers save lives.

Lifting the veil of thick smoke and restoring sight greatly reduces search time, improving the odds of rapidly locating and extricating trapped victims. The primary benefit of using thermal imaging technology is the improvement to firefighter safety. When firefighter visibility is restored, safety is dramatically increased. Orientation, both within a specific room as well as the structure in general, improves considerably when the firefighter can see the furnishings and understand the layout.

**Equipping each firefighter with
a thermal imager means
firefighters now have more
“eyes” in a fire, lessening the
likelihood that a firefighter
will become disoriented,
trapped or lost.**

Accountability is improved when firefighters can see each other. Rescuing and assisting other firefighters is also quicker and more efficient with a thermal imager. Equipping each firefighter with a thermal imager increases the speed in which a crew can travel through a fire, improves accuracy, and reduces errors in image interpretation. Having a thermal imager in the hands of each firefighter improves the efficiency of search operations and lessens property damage because firefighters can move faster through a fire scene.

In 2009, Bullard introduced the Eclipse™ Thermal Imager, designed to provide firefighters with a tool to help them safely navigate a fire. The innovative technology of the Bullard Eclipse makes it a perfect navigational, personal-issue thermal imager for firefighters. Its small and lightweight frame can be clipped to a firefighter's gear, instantly providing firefighters with a critical, life-saving device tool at their fingertips.

Firefighter disorientation is one of the leading causes of firefighter deaths during structural firefighting. Disorientation occurs when firefighters lose their sense of direction when visibility inside a structure is close to zero. Once disoriented, the firefighter has only a limited amount of time to find his way out of the structure or otherwise call for assistance. Equipping each firefighter with a

thermal imager means firefighters now have more “eyes” in a fire, lessening the likelihood that a firefighter will become disoriented, trapped or lost.

With more “eyes” in a fire, firefighters have more opportunities to spot various hazards and dangers, such as increasing heat levels, structural weaknesses in the floor or ceilings, hanging electrical lines, stairs or skylights, fallen furniture and other household items. In addition, if an imager is dropped or lost, firefighters can rely on the other imagers to navigate the fire. The concept of multiple thermal imagers on the scene of a fire is not necessarily new. What is new is having multiple thermal imagers with the same firefighting crew. Putting more thermal imagers into the hands of trained and capable firefighters can dramatically improve the efficiency of fighting fires.

In the case of the Eclipse, it should be used with an advanced thermal imager, such as the Bullard T4MAX. The T4MAX offers thermal imaging features that help firefighters analyse a scene, conduct size-up and investigate. Features such as Electronic Thermal Throttle®, Super Red Hot®, ultra-high resolution and digital zoom give firefighters advanced information on a scene. These advanced thermal imagers are vital tools for every fire department. One firefighter with an advanced thermal imager for analysis along with a team of firefighters using navigational thermal imagers mean every firefighter now has sight.

Search and rescue

There is simply no comparison between search time without a thermal imager and search time



with a thermal imager. A time study conducted in 2001 revealed a staggering 75 percent decrease in search times when a thermal imager was used versus traditional crawl-and-grope. But this was not the only benefit; in the crawl-and-grope method, 30 percent of the victims were never located. When a thermal imager was utilised, the percentage of located victims climbed to 99 percent. So search time reduced by 75 percent, and lives saved was increased by 39 percent.

Deployment options

When looking at deployment models there are essentially four different levels of deployment that exist within the fire service. These different levels are quantified, not by the overall volume of imagers owned, but by how deeply ingrained ther-

ULTRA SMALL, SUPER LIGHTWEIGHT.

eclipse™

A THERMAL IMAGER FOR EVERY FIREFIGHTER IS NOW A REALITY.

With Eclipse, each firefighter can have his or her own thermal imager. Eclipse makes it affordable to outfit your entire crew.

Another innovation from the leader in thermal imaging.
And as always, built Bullard Tough™.

www.bullard.com

Bullard Asia Pacific
(+65) 6745 0556
Email: bullardasia@bullard.com



mal imaging has become within that fire department. The four primary deployment models are:

One thermal imager for the entire department: Departments that have adopted this deployment model are typically very small or severely budget-constrained or both.

One thermal imager for each station: Departments adopting this model are usually attempting to ensure that a thermal imager is present on all fires. However, there are times when the first apparatus to arrive from a given station is not the one equipped with a thermal imager. If the thermal imager is not first to arrive, most of the benefits to trapped victims have been lost by the

deployment. They have moved the technology beyond search and rescue and have begun to address the issues of firefighter disorientation and firefighter safety by equipping each firefighter with a thermal imager. Everyone engaged in fighting the fire now has sight.

The deployment model your department chooses will have a significant impact on how thermal imagers are used and implemented. As you move up in deployment model (from one to four) more money is typically required. However, with reduced search times and greater efficiency, the return on investment occurs incrementally unless the thermal imager is used to save a life, at which point the payback is immediate.

The deployment model your department chooses will have a significant impact on how thermal imagers are used and implemented. As you move up in deployment model (from one to four) more money is typically required.

delayed arrival. In this deployment model, the thermal imager is often used in search and rescue but sometimes, due to late arrival, not used until the secondary search.

One thermal imager for fire appliance: Departments adopting this deployment model usually value thermal imaging and have made a significant commitment to make sure that a thermal imager is always on the first vehicle to arrive. In this deployment model, the thermal imager is intended to be used during primary search and all other fire operations.

One thermal imager for each firefighter (riding position): This is really "the next frontier" in thermal imaging. Departments that have adopted this model are on the cutting edge of thermal imaging

Affordability

Thermal imagers are now within the budgetary grasp of every fire department, regardless of size. Models such as the Eclipse thermal imager make it affordable for every fire department to have a navigational thermal imaging tool. In addition, every fire department needs an advanced thermal imager, like the T4MAX. With an advanced thermal imager in the lead and Eclipse thermal imagers in a secondary position, all firefighters in the crew can travel at an equal speed and enhance crew accountability and safety.

Of course, like any piece of equipment, the expense must be balanced against the benefit. Increased firefighter safety, increased operational efficiency, and most importantly, decreased search times all reinforce the value of thermal imaging. If you don't have one, consider getting one. You owe it to your firefighters and your community. **APF**

For further information go to
www.bullard.com



Quic-Lock SCBA Bracket
Model: QLM-U

For over 45 years ZICO has been providing the fire service with quality products and dependable service. We stand behind all of our products and are constantly improving existing ones to ensure customer satisfaction. When the name ZICO or ZIAMATIC appears on a product you can be assured of a top quality product at a reasonable price...backed by extensive field testing.

ZICO

Complete line of
halligan bars



**Quic-Hold
Mechanical
SCBA Bracket**



**Quic-Draft
Floating
Strainers**



**Quic-Draft
Suction Strainers**

Australian Firefight

Cambodian Teamwork



By Jamie Hansen

Director Infrastructure
Development AFIRE

Australian firefighters are lending a hand to build the capacity of fire services in developing countries.

A visit to Cambodia in 2006 by Australian firefighters proved to be the catalyst for the formation of a relief fund to specifically address firefighting resources and training. Noticeably visible was a lack of standardised training, incompatibility of equipment and vehicles, insufficient quantities and inappropriate personal protective clothing, negative community perception of the fire department, no standard operating procedures, perceived corruption of fire service members and minimal maintenance of equipment and many unserviceable vehicles and equipment.

Australian Firefighters International Relief and Education (AFIRE) – a not for profit organisation – was established later that year by Australian firefighters who were prepared to donate their time and expertise to assist fire services in Cambodia and other developing countries.

AFIRE's credo is to provide an holistic approach to fire service development in order to create a self-sustainable emergency service; one that is capable of providing safe and effective emergency response in all emergency incidents and to ensure accountability at all times. The organisation achieves this by working closely with the relevant authorities and conducting a comprehensive skills, knowledge and infrastructure gap analysis when planning any projects, training or improvements. Their assistance is provided beyond the borders of

services, departments, states, countries, cultures or religions.

Assistance in the training of firefighters, community education, infrastructure development, operating procedures, policies and legislation has seen AFIRE acknowledged worldwide as professional and unique in its holistic approach to fire service development in developing countries.

Paul Hurford, a fire officer with CFA (Country Fire Authority), together with leading firefighter Jamie Hansen, and Dave Miller, a commander with the Metropolitan Fire Brigade of Melbourne form the core of the AFIRE operational management team. This team draws upon combined experience of more than 50 years service to coordinate all overseas projects and guide the development of AFIRE.

AFIRE has now been working with the Cambodian Fire Department for the past three years. The Department comprises 480 firefighters who are employed by the police force and, as such, are in fact police officers performing the role of firefighters. Prior to AFIRE's involvement, the Cambodian firefighters received little, if any, fire rescue training.

Through the good intentions of many different countries and organisations there has been a reasonable quantity of firefighting equipment and vehicles donated to Cambodia. However, to date,

ters In Cambodia

none of this aid has been coordinated. With support from the Victorian Country Fire Authority, Melbourne Metropolitan Fire Brigade (MFB), the State Emergency Service Victoria, Victoria Police, and the tireless efforts of the membership, AFIRE has trained over 350 firefighters, issued personal protective clothing to 350 firefighters, started the standardisation of hose, couplings and vehicle typology, designed a new Cambodian Fire Department badge, introduced a community education package and had significant input into standard operating procedures.

As part of developing the Cambodian Fire Service, AFIRE has also been training the firefighters of the internationally-operated Airport Fire Service and has successfully fostered an integrated relationship between the two services.

Recently, AFIRE has begun work in East Timor [Timor Leste]. Following the good work in Cambodia, AFIRE was engaged by the United Nations to conduct a "scoping mission" of the Timor Leste National Fire Service and to assess its capacity to provide a safe and effective emergency response to the community. East Timor exhibits similar challenges to those found in Cambodia and AFIRE is confident it can achieve the same successes in East Timor as it has in Cambodia.

To date, the vast majority of instructors have been from CFA and MFB in Victoria. However, in recent months AFIRE has been looking to involve emergency service staff from other Australian States and Territories. The organisation now has



Cambodian Rescue Training

people from New South Wales, Northern Territory, Queensland, South Australia, Tasmania and Western Australia, who have expressed an interest in becoming involved in the unique challenge of working in developing countries and using their skills and knowledge to assist those less fortunate. All AFIRE members and instructors volunteer their time and are self-funded.

Airservices Australia [an Australian government-owned corporation that provides aviation rescue and firefighting services] has also indicated that it is interested in providing support to AFIRE's endeavours in developing countries. AFIRE has also formed a positive relationship with AFAC (Australasian Fire and Emergency Service Authorities Council) and is currently discussing ways in which Australian fire services can assist AFIRE without neglecting their commitments to the Pacific Island Fire Service Association. Working relationships are also being established with Commonwealth and Victorian Governments, AusAID – the Australian Government Overseas Aid Program – the United Nations and various "Friends of" groups that will make the next 12 months quite favourable for AFIRE and its long term goals.

2010 has become an exciting year with a rapid expansion of overseas involvement and opportunities for Australian firefighters to travel and instruct. There have also been many opportunities for members to become involved in fundraising events and campaigns, which AFIRE encourages and support. What may seem like a small effort can often be the link to the bigger picture. To all of the members who have participated so far, we sincerely thank you and look forward to your future involvement.

APF

Jamie Hansen is Director Infrastructure Development at AFIRE. For more information go to www.afire.org.au



Cambodian Water

Distributor and Representative Offices

BAUER COMPRESSORS

AUSTRALIA

BAUER KOMPRESSOREN AUSTRALIA PTY LTD

2/35 Hallstrom Place
Wetherill Park
Sydney, NSW 2164 Australia
Tel: +61 (0)2 9756 2700
Fax: +61 (0)2 9756 1700
Email: enquiries@bauer-kompressoren.com.au
Bauer Subsidiary Office

BANGLADESH

BIZ2SAFE ENTERPRISE PTE LTD

192/1 East Kafrul
Dhaka Cantonment
Dhaka 1206
Bangladesh
Contact: Mr Gupta
Tel: 88 0 2 875 0010 or 9198 202 98969
Fax: 88 0 2 871 4400
Email: biz2save@gmail.com
Dealer/Distributor

BRUNEI

BAUER COMPRESSORS ASIA PTE LTD

2 Penjuru Place
#01-05 Penjuru Tech Hub
Singapore 608783
Contact: Mr Russell Parton (Managing Director)
Tel: +65 6271 6271
Fax: +65 6272 3345
Email: info@bauer-compressors.com.sg
Bauer Subsidiary Office

CHINA

BAUER KOMPRESSOREN SHANGHAI LTD

878 Jianchuan Road
Minhang
Shanghai
China 200240
Tel: +86 21 5471 3598
Fax: +86 21 5471 3818
Email: sales.sh@bauerchina.com
Bauer Subsidiary Office

FRENCH POLYNESIA

TAHITI SPORT

PO Box 62, 98713 Papeete
Tahiti, French Polynesia
Contact: Mr Thierry Alberola
Tel: +689 505959
Fax: +689 421775
Email: plongee@tahiti-sport.pf
Dealer/Distributor

HONG KONG

BAUER KOMPRESSOREN CHINA LTD

707 Block A
M.P. Industrial Centre
18 Ka Yip Street, Chaiwan
Hong Kong
Tel: +852 2595 1898
Fax: +852 2595 0878
Email: bkc@bauerchina.com
Bauer Subsidiary Office

INDIA

BAUER KOMPRESSOREN INDIA PVT LTD

A 71/72, H Block
MIDC Pimpri
Pune – 411 018
India
Tel: +91 20 67308100 to 7
Fax: +91 20 27487000
Email: info@bauer-kompressoren.in
Bauer Subsidiary Office

INDONESIA

MARINE & INDUSTRIAL COMPRESSORS

304 Thomson Road, Singapore 307654
Contact: Mr Sng
Tel: +65 6250 6018
Fax: +65 6253 8443
Email: masmarin@singnet.com.sg
Dealer/Distributor

KOREA

TECKO CO LTD

2F, SK@Technopark, Mega-Dong
190-1 Sangdaewon-Dong, Sungnam-City
Kyungki-Do 462 807, Korea
Contact: Mr K Y Lee
Tel: +82 31 776 2442
Fax: +82 31 776 2444
Email: kylee@tecko.co.kr
Dealer/Distributor

MALAYSIA

SK CRYOGENICS SDN BHD

No. 16 Jalan Anngerik Mokara 31/52
Section 31, Kota Kemuning
40460 Shah Alam, Selangor, Malaysia
Contact: Mr Steve Kellett
Tel: +60 3 5122 4269
Fax: +60 3 5122 4235
Email: steve@skcryogenics.com
Dealer/Distributor

PAKISTAN

ALPINE INDUSTRIALCON PVT LTD

305/2 G.T. Road, Baghbanpura
Lahore, Pakistan
Contact: Mr Kashif Ahmad
Tel: +92 42 685 2313
Fax: +92 42 655 3674
Email: alpinelahore@hotmail.com
Dealer/Distributor

PHILIPPINES

CEBU ERNBRI IMPORT INC/ AQUAVENTURE WHITETIP DIVE SUPPLY

Ermita Office: Unit 101 Joncor II Bldg
#1362 A. Mabini Street
Ermita Manila Philippines 1000, Philippines
Contact: Mr Brian L Giles
Tel: +632 521 0433
Fax: +632 522 1165
Email: brian@aquaventurewhitetip.com
Dealer/Distributor

SINGAPORE

BAUER COMPRESSORS ASIA PTE LTD

2 Penjuru Place
#01-05 Penjuru Tech Hub
Singapore 608783
Contact: Mr Stephen Hines (Managing Director)
Tel: +65 6271 6271
Fax: +65 6272 3345
Email: info@bauer-compressors.com.sg
Bauer Subsidiary Office

MARINE & INDUSTRIAL COMPRESSORS

304 Thomson Road, Singapore 307654
Contact: Mr C H Sng
Tel: +65 6250 6018
Fax: +65 6253 8443
Email: masmarin@singnet.com.sg
Dealer/Distributor

SRI LANKA

HALCHEM LANKA PVT LTD

No 7, Siri Dhamma Mawatha
Colombo 10, Sri Lanka
Contact: Mr Cyril Halloluwa Managing Director
Tel: +94 11 5843213 and 5843219 (Direct)
Fax: +94 11 2674 615 and 2792 406
Email: cyril.halloluwa@halchem-lanka.com
Website: www.halchem-lanka.com
Dealer/Distributor

TAIWAN

MING SHEN ENTERPRISE CO LTD

5, PaShih 1 Street, DanShui Town
Taipei, Taiwan 25170, Taiwan
Contact: Mr Tom Tseng
Tel: +886 (2) 2809 5789
Fax: +886 (2) 2809 6189
Email: tom@3arrow.com.tw
Dealer/Distributor

THAILAND

DIVE SUPPLY CO LTD

88/5 Patak Rd
Chalong Bay
Phuket 83130
Thailand
Tel: +66 (76) 383414
Fax: +66 (76) 281525
Email: gm@divesupply.com
Dealer/Distributor

INTERSOL ENGINEERING & TECHNOLOGY PTE LTD

7/288 Moo 6, Chaengwattana Road
Bhanmai, Pakkred
Nonthaburi 11120
Thailand
Contact: Mr Nathanan
Tel: +66 2 9808754
Fax: +66 2 9808753
Email: nathanan@intersol.th.com
Dealer/Distributor

VIETNAM

FRANCO-PACIFIC VIETNAM CO LTD

55 Ho Hao Hon Street
District 1, Ho Chi Minh City
Vietnam
Contact: Mr Colm Minogue
Tel: +84 8 836 0257
Fax: +84 8 836 1387
Email: colminogue@francopacific.com
Dealer/Distributor

BRISTOL UNIFORMS

AUSTRALIA

PAC FIRE AUSTRALIA (formerly Pacific Helmets Australia)

Unit 1, 28 Burnside Road
Hallmarc Business Park
Yatala Qld 4207, Australia
Tel: +61 7 3441 7100
Fax: +61 7 3441 7177
Email: sales@pacfire.com.au
Website: www.pacfire.com.au
Dealer/Distributor

BANGLADESH

MANIK BROTHERS

Hai Mansion (3rd Floor)
9/3 Motijheel Circular Road
Dhaka – 1000, Bangladesh
Contact: Mr A K Bhowmick
Tel: +880 2 7100 589
Fax: +880 2 7100 386
Email: manikbrs@1postbox.com
Dealer/Distributor

BRUNEI

DASAPREM (M) SDN BHD

10 & 12 Jalan Muara 8/9
40000 Shah Alam
Selangor, Darul Ehsan
Malaysia
Contact: Mr Prem R Murthy
Tel: +603 550 9060
Fax: +603 550 4486
Email: dasaprem@yahoo.com
Website: www.dasaprem.com
Dealer/Distributor

YEN LEE FIREWELD PTE LTD

18 Penhas Road, 208182, Singapore
Tel: +65 62909890
Fax: +65 62961444
Email: jeffrey@fireweld.com.sg
Dealer/Distributor

CHINA**SHENZHEN RUFN INDUSTRIAL CO LTD**

RM-701, 7/F Leaser Tower
1st Fuhua Rd, Shenzhen, China
Contact: Amy Jin
Tel: +86 755 8399 9581
Fax: +86 755 8399 9548
Email: wj@rufn88.com
Dealer/Distributor

FIJI**PHILLIPS & SMITH LTD**

10 Akatea Road, Glendene
Auckland, New Zealand
Contact: Mr S Hampton
Tel: +649 818 8048
Fax: +649 818 4484
Email: stuart@firemaster.co.nz
Website: www.firemaster.co.nz
Dealer/Distributor

HONG KONG**CHUBB HONG KONG LTD**

3 Hok Yuen Street East
Hung Hom
Kowloon
Hong Kong
Contact: Mr Simon Tsang
Tel: +852 2746 9628
Fax: +852 2785 0849
Email: simonsft.chubb.com.hk
Website: www.chubb.com.hk
Dealer/Distributor

INDIA**FOREMOST MARKETING PVT LTD**

M-1 Green Park Extn,
New Delhi 110016 India
Contact: Mr Vinay Khanna
Tel: +91 11 261 969 82
Fax: +91 11 261 669 61
Email: foremost@vsnl.net
Website: www.foremostsafety.com
Dealer/Distributor

JAPAN**ABLE-YAMAUCHI CO LTD**

Yokohama Nishiguchi, SIA Building
10-36 Kitasaiwai
2-Chome Nishi-Ku
Yokohama 220-0004
Japan
Contact: S Yamauchi
Tel: +81 45 312 1130
Fax: +81 45 312 1350
Email: emiko@able-yamauchi.co.jp
Website: www.able-yamauchi.co.jp
Dealer/Distributor

MALAYSIA**DASAPREM (M) SDN BHD**

10 & 12 Jalan Muara 8/9
40000 Shah Alam
Selangor Darul Ehsan, Malaysia
Contact: Mr Prem R Murthy
Tel: +603 550 9060
Fax: +603 550 4486
Email: dasaprem@yahoo.com
Website: www.dasaprem.com
Dealer/Distributor

EAST MALAYSIA**YEN LEE FIREWELD PTE LTD**

18 Penhas Road, 208182
Singapore
Tel: +65 62909890
Fax: +65 62961444
Email: jeffrey@fireweld.com.sg
Dealer/Distributor

NEW ZEALAND**PHILLIPS & SMITH LTD**

10 Akatea Road
Glendene
Auckland
New Zealand
Contact: Mr S Hampton
Tel: +649 818 8048
Fax: +649 818 4484
Email: stuart@firemaster.co.nz
Website: www.firemaster.co.nz
Dealer/Distributor

SINGAPORE**YEN LEE FIREWELD PTE LTD**

18 Penhas Road
208182, Singapore
Tel: +65 62909890
Fax: +65 62961444
Email: jeffrey@fireweld.com.sg
Website: www.fireweld.com.sg
Dealer/Distributor

SRI LANKA**FIRETECH (PRIVATE) LTD**

34 Walter Gunesekara Mawatha
Nawala
Sri Lanka
Contact: Leon Daniels
Tel: +94 11 4410588
Fax: +94 11 2806666
Email: firetech@pan.lk
Dealer/Distributor

TAIWAN**SHENG-TAI FIRE PROTECTION INDUSTRIAL CO LTD**

No 222-2 Sec2
Cheng Tai Rd
Wu-Ku Shiang
Taipei, Hsien, Taiwan
Contact: Liu Yuan Hung
Tel: +886 2292 1751
Fax: +886 2291 1984
Email: sato@mail.mold.net.tw
Website: www.shengtai.com.tw
Dealer/Distributor

VIETNAM**TRAN VU TRADING CO LTD**

61 Ban Co Street, District 3
Hochiminh City
Viet Nam
Contact: Tran Vu Hong
Tel: +84 88325101
Fax: +84 88309586
Email: sales@tranvufire.com
Website: www.tranvufire.com
Dealer/Distributor

COLTRI ASIA PACIFIC**CHINA****SHANGHAI AND SOUTHERN CHINA:****SHANGHAI PANNY TRADING CO LTD**

3F, #17-2 No.230
Xinjingqiao Rd.
Pudong new area, Shanghai China
Contact: Mr Todd
Tel: +86-21-50321062
Fax: +86-21-50321063
Email: panny-ye@hotmail.com
Website: www.coltrisub-china.com
Dealer/Distributor

HONG KONG AND MACAU**WAH SHING COMPANY**

No. 2B-2C, G/F., Larch Street
Tai Kok Tsui,
Kowloon, Hong Kong SAR
Contact: Miss Jackio Kwok
Tel: +852 2391 3997, +852 2391 4084
Fax: +852 2789 4638
Email: wahshingcompany@gmail.com
Dealer/Distributor

INDIA**JYO TECH ENGINEERING & MARKETING**

H-49 A, Kalkaji, New Delhi 110019 India
Tel: +91 (11) 26447966
Fax: +91 (11) 26482189
Email: jyotech@del3.vsnl.net.in
Dealer/Distributor

INDONESIA**DIVEMASTERS INDONESIA JAKARTA**

Jl.Bangka Raya No.39A Jakarta 12720 Indonesia
Tel: +6221 7199045
Fax: +6221 7198974
Dealer/Distributor

BALI

Jl. By Pass I Gusti Ngurah Rai No. 314 Sanur,
Denpasar 80228 Bali
Indonesia
Tel: +62361 283138
Fax: +62361 285736
Email: sales@divemasters.co.id
Dealer/Distributor

LAUTAN MAS

Jl. Toko Tiga No. 24 Jakarta 11230 Indonesia
Tel: +62 (0) 21 690-1333
Fax: +62 (0) 21 690 2479
Email: info@lautanmas.com
Website: www.lautanmas.com
Dealer/Distributor

MALAYSIA**RAINBOW RUNNER S/B**

383D Jln Ampang 50450
Kuala Lumpur Malaysia
Tel: +60 (03) 42514368 or 42515368
Fax: +60 (03) 42511268
Branch: 3.06, Plaza Berjaya Jln Imbi
55100 Kuala Lumpur Malaysia
Tel: +60 (03) 21414587
Fax: +60 (03) 21487440
Website: www.rainbowrunner.net
Dealer/Distributor

MALDIVES**MARKETECH MALDIVES PVT LTD**

M.Iramaa, 1st Floor, Fareedhi Magu
Rep of Maldives
Tel: +(960) 3331911
Fax: +(960) 3318815
Email: ahmed@marketechmaldives.com
Dealer/Distributor

NEW ZEALAND**AIR TECHNOLOGY LTD**

5/20 Constellation Drive
Mairangi Bay 0632 Auckland
PO Box 305065 Triton Plaza
North Shore, Auckland 0757, New Zealand
Contact: Ross Irvine
Tel: 64-9-478 9995
Fax: 64-9-478 6221
Website: www.divecompressors.co.nz
Dealer/Distributor

PHILIPPINES**AQUAMUNDO SPORTS INC**

G/FVernida I Bldg.
120 Amoroso St. Legaspi Village
Makati City, Philippines 1229
Tel: (+632) 813-AQUA (2782)
(+632) 817-AQUA (2782)
Fax: Dial local 13
Email: info@aquamundosports.com,
scuba@aquamundosports.com
Dealer/Distributor

SINGAPORE**ALLROUND ADVANCED TECHNOLOGIES PTE LTD**

105 Sims Ave #03-06 Chancerylodge Complex
Singapore 387429
Tel: +65 749 2778
Fax: +65 749 2977
Email: enquiry@allround.com.sg
Dealer/Distributor

KOREA, REPUBLIC OF**DAE WOONG SUITS CO LTD**

1614-15, Seocho-Dong
Seocho-Ku, Seoul
Korea
Tel: 82-2-588-0970
Fax: 82-2-587-0392
Email: mares@mares.co.kr
Website: www.mares.co.kr
Dealer/Distributor

TAIWAN**NELVEN CO LTD**

14F-6, No. 76, Sec. 1
Fu-Shings South Rd
Taipei City 106, Taiwan
Tel: (886) 2-2721-9770
Fax: (886) 2-8773-2047
Email: nelven@ms18.hinet.net
Website: www.nelven.com.tw
Dealer/Distributor

THAILAND, VIETNAM, CAMBODIA, SRI LANKA**SIAM DIVING ENTERPRISES ASIA
PACIFIC CO LTD**

No. 12, Chaloeprakiat Ratchakan Thi 9 Road
Soi 48, Dokmai
Pravet
Bangkok, 10250
Thailand
Tel: +66 2 726-6101-5
Fax: +66 2 726-6106
Email: c.benelli@aerotecnicacoltriasiapacific.com,
sdesystems@csloxinfo.com
Website: www.aerotecnicacoltriasiapacific.com
Dealer/Distributor

VIETNAM**SCUBA SUPPLY**

120/54a Nguyen Thien Thuat Street, Nha Trang,
Vietnam
Tel: +84 (0) 914 029 790
Fax: +84 (0) 58 252 0576
Email: craig@scubavietnam.com
Website: www.scubavietnam.com
Dealer/Distributor

**AUSTRALIA****KDW CONSULTING LLC**

3023 Sonoma Way, Viera
FL 32955, USA
Contact: Kenton D Warner
Tel: 321 636 4543
Fax: 928 438 6382
Email: kenwarner@att.net
Website: www.cuttersedge.com
Representative Office

CHINA**ANCOM**

Building 5, Courtyard 10 Village
Middleroad
North 3rd Ring Road
Contact: Pei Zhang
Tel: 86 10 6202 2792
Fax: 86 10 6207 7929
Email: hung.fang@utoronto.ca
Website: www.ancom.cn/www.cuttersedge.com
Dealer/Distributor

NORLAN ENTERPRISES INC

Room 952, #218 Tang Li Road
China
Contact: Helen Wang
Tel: 86 10 8467 3721/8467 3722
Fax: 86 10 8467 3770
Email: helenwang@norlan.cn
Website: www.norlan.cn/www.cuttersedge.com
Dealer/Distributor

WUXI NEW FIRE TRE SAFETECH LTD

Block 3, Long Shan Wen Bo Industrial Park
Qian Yao Road, Hu Bin District
Wuxi, Jiangsu Province, PRC 214151
Tel: +86 510 8225 5991
Fax: +86 510 8275 4257
Email: mail@wfs.com.cn
Website: www.wfs.com.cn
Dealer/Distributor

INDIA**ASKA EQUIPMENTS LTD**

Aska House, 193 Deepali
Deepali Chowk, Outer Ring Road – Pitampura
New Delhi 110 034, India
Contact: Navdeep Garg
Tel: 91 11 27014416/27014417
Fax: 91 11 27014413
Email: info@askagroup.com
Website: www.askagroup.com/
www.cuttersedge.com
Dealer/Distributor

ISRAEL**OFER FIRE RESCUE & SALVAGE LTD**

Binyamina 30500, Israel
Contact: Ofer Halamish
Tel: 972 4 6288444
Fax: 972 4 6288555
Email: ofer@ofer.co.il
Website: www.ofere.co.il/www.cuttersedge.com
Dealer/Distributor

JAPAN**TEIKOKU SEN-I CO LTD**

5-13,2 Chome
Nihonbashi
Chuo-Ku
Tokyo 103
Japan
Tel: 81-3-3281-3026
Fax: 81-3-3274-6397
Email: teisen-tyo@teisen.co.jp
Website: www.teisen.co.jp/www.cuttersedge.com
Dealer/Distributor

KOREA**KDW CONSULTING LLC**

3023 Sonoma Way, Viera, FL 32955, USA
Contact: Kenton D Warner
Tel: 321 636 4543
Fax: 928 438 6382
Email: kenwarner@att.net
Website: www.cuttersedge.com
Representative Office

MALAYSIA**CITO MARKETING, SDN BHD**

No. 11, Jalan SS15/4B
Subang Jaya
47500 Petaling Jaya, Selangor
Darul Ehsan
Contact: Ahmad Nazmi Abu Raihan
Tel: +603 5631 1286
Fax: +603 5634 0583
Email: info@citogroup.co.my
nazmi@citogroup.com.my
Website: www.cuttersedge.com
Dealer/Distributor

PHILLIPINES**KDW CONSULTING LLC**

3023 Sonoma Way, Viera, FL 32955 USA
Contact: Kenton D Warner
Tel: 321 636 4543
Fax: 928 438 6382
Email: kenwarner@att.net
Website: www.cuttersedge.com
Representative Office

SINGAPORE**KDW CONSULTING LLC**

3023 Sonoma Way, Viera, FL 32955 USA
Contact: Kenton D Warner
Tel: 321 636 4543
Fax: 928 438 6382
Email: kenwarner@att.net
Website: www.cuttersedge.com
Representative Office

SOUTH KOREA**JINUTEC INTERNATIONAL DIVISION**

711 Visiontop Officetel 374-4
Won-Dong, Osan-City, South Korea
Contact: Na Hae-Yul
Tel: 82 31 375 8558
Fax: 82 31 375 4884
Email: hyna@jinutec.com
Website: www.jinutec.com/www.cuttersedge.com
Dealer/Distributor

THAILAND**KDW CONSULTING LLC**

3023 Sonoma Way, Viera, FL 32955 USA
Contact: Kenton D Warner
Tel: 321 636 4543
Fax: 928 438 6382
Email: kenwarner@att.net
Website: www.cuttersedge.com
Representative Office

Dräger**AUSTRALIA****DRAEGER SAFETY PACIFIC**

Axxess Corporate Park, Unit 99, 45 Gilby Road
Mount Waverley, Victoria 3149
Tel: +61 3 9265 5000
Fax: +61 3 9265 5097
Email: customer.service@draeger.com
Representative Office

CHINA**BEIJING FORTUNE DRAEGER SAFETY
EQUIPMENT CO LTD**

Yu An Lu 22, B Area
Beijing Tianzhu Airport Industrial Zone
Shunyi District, Beijing, 101300
Tel: +86 10 8049 8000
Fax: +86 10 8049 8005
Email: sales.safety.cn@draeger.com
Representative Office

INDIA**JOSEPH LESLIE DRAEGER MFG PVT LTD**

Leslico House, Prof. Agashe Road
Off 87-C, Bhavani Shankar Road
Dadar (West)
Mumbai 400028
Tel: +91-22-2422 1880/1878/7198
Fax: +91-22-2430 3705
Email: mumbai@lesliedraeger.com
Representative Office

INDONESIA**PT DRAEGERINDO JAYA**

Beverly Antasari Building
Jl. Pangeran Antasari No. 67, Unit L
Cilandak Barat, Jakarta
Selatan 12430
Tel: +6221 751 3289
Fax: +6221 751 2052
Email: product_support@draeger.co.id
Representative Office

JAPAN**DRAEGER SAFETY JAPAN LTD**

3-8-1 Toyo Koto-ku
Tokyo, Japan
Japan Zip 135-0016
Tel: +81 3 44 615111
Fax: +81 3 44 615100
Email: sales.safety.jp@draeger.com
Representative Office

KOREA**DRAEGER SAFETY ASIA**

Daejong Bld. #1106
Bang-l-dong, Songpa gu
Seoul, Korea
Tel: +82 2 6415 8222
Fax: +82 2 6415 8223
Email: sdseo3@maginc.com
Representative Office

MALAYSIA**DRAEGER SAFETY ASIA PTE LTD**

No. 14, Jalan PJS 11/18, Bandar Sunway 46150
 Petaling Jaya, Malaysia
 Tel: +60 3 5635 6460
 Fax: +60 3 5635 4171
 Email: dsa.malaysia@draeger.com

Representative Office**NEW ZEALAND****DRAEGER SAFETY PACIFIC PTE LTD**

Unit O, No. 150
 Harris Road, East Tamaki, Auckland
 Tel: +649 273 3160
 Fax: +649 273 3159
 Email: customer.service@draeger.com

Representative Office**SINGAPORE****DRAEGER SAFETY ASIA PTE LTD**

67 Ayer Rajah Crescent #06-03
 Singapore 139950
 Tel: +65 6872 9281
 Fax: +65 6512 1908
 Email: dsa.singapore@draeger.com
 Website: www.draeger.com.sg

Regional Head Office**TAIWAN****DRAEGER SAFETY TAIWAN CO LTD**

12/F, Kuohwa Building
 868-5 Chungcheng Road, Chungho City
 Taipei County, 235 Taiwan R.O.C.
 Tel: +886 (02)2223-6388
 Fax: +886 (02)2223-2258
 Email: sales.taiwan@draeger.com

Representative Office**THAILAND****DRAEGER SAFETY (THAILAND) LTD**

123/20, Nonsi Road
 Kwaeng Chongnonsi
 Khet Yannawa, Bangkok 10120
 Tel: +662 6811 781 (4 lines)
 Fax: +662 6811 780
 Email: sales.thailand@draeger.com

Representative Office**VIETNAM****DRAEGER SAFETY ASIA PTE LTD**

No. 5, A2 Nguyen Khanh Toan Str.
 Cau Giay District
 Hanoi
 Vietnam
 Tel: +84 4 281 3463
 Fax: +84 4 281 3461
 Email: sales.safety.vn@draeger.com

Representative Office

DUPONT FIRE EXTINGUISHANTS

UNITED ARAB EMIRATES**FENWAL PROTECTION SYSTEMS**

Bu Ameem Building II, Suite 201
 PO Box 30791
 Dubai
 United Arab Emirates
 Contact: Tareq El-Iman
 Tel: 971 4.337.2498
 Fax: 971 4.337.5088
 Email: tareq.imam@kiddeme.co.ae
 Website: www.fenwalfire.com

Dealer/Distributor**KIDDE FIRE SYSTEMS**

Bu Ameem Building II, Suite 201
 PO Box 30791, Dubai
 United Arab Emirates
 Contact: Tareq El-Iman
 Tel: 971 4.337.2498
 Fax: 971 4.337.5088
 Email: tareq.imam@kiddeme.co.ae
 Website: www.kiddefiresystems.com

Dealer/Distributor**AUSTRALIA****FIRE PROTECTION TECHNOLOGIES
PTY LTD**

Unit 14, 42-44 Garden Blvd
 Dingley, Victoria 3712
 Australia
 Tel: +61 3 9558 0715
 Fax: +61 3 9558 0725
 Email: Enquiries@fire-protection.com.au
 Website: www.fire-protection.com.au

Dealer/Distributor**BANGLADESH****NAVANA INTERLINKS LTD**

7, Champaklal Udyog Bhavan
 Sion (E) Mumbai 400 022, India
 Tel: +88 02-9892911
 Fax: +88 02-9895252
 Email: info@navana-iv.com
 Website: www.navana-iv.com

Dealer/Distributor**HONG KONG****THE JARDINE ENGINEERING
CORPORATION LTD**

13/F Somerset House, Taikoo Place
 979 King's Road, Hong Kong
 Tel: +852 2807 4684
 Fax: +852 2503 4210
 Email: yick-kuen.kwong@jec.com
 Website: www.jec.com

Dealer/Distributor**INDIA****NEWAGE INDUSTRIES**

Champaklal Udyog Bhavan
 Unit No. 7, Sion (East), Mumbai 100 022, India
 Tel: +91 22 2407 7421
 Fax: +91 22 2407 4229
 Email: info@newage-india.com
 Website: www.newage-india.com

Dealer/Distributor**INDONESIA****KARYA LESTARI MAKMUR PT**

Jl. Pangeran Jayakarta, 85AK, Jakarta 10730,
 Indonesia
 Tel: +62 21 628 1933
 Fax: +62 21 628 1976
 Email: johnklima@cbn.net.id

Dealer/Distributor**KOREA****PARADISE INDUSTRY CO LTD**

#683-116 Hannam-Dong, Yongsan-Ku
 Seoul, South Korea
 Tel: +82 2 3780 8770
 Fax: +82 2 3780 8772
 Email: shlee@paradise-ind.co.kr
 Website: www.paradise-ind.co.kr

Dealer/Distributor**MALAYSIA****FIKE ASIA PACIFIC SDN BHD**

18B, 2nd Floor, Jalan Astak L U8/L
 Bukit Jelutong, 40150 Shah Alam, Selangor, Malaysia
 Tel: +60 3 7859 1462
 Fax: +60 3 7859 1461
 Email: chun-wah.leong@fike.com
 Website: www.fike.com

Representative Office**SUKIADA ENGINEERING SDN BHD**

No. 20 Jalan Astaka L U8/L, Bukit Jelutong
 40150 Shah Alam, Selangor, Malaysia
 Tel: +60 3 7845 2008
 Fax: +60 3 7845 6008
 Email: bk Wong@sukiada.com.my
 Website: www.sukiada.com.my

Dealer/Distributor**PAKISTAN****MGH ENGINEERING AND CONTROL
PVT LTD**

H. # 20 St., #5/A Kot Shahabdin
 Shahdrah, Lahore 54950, Pakistan
 Tel: +92 42 7913064
 Fax: +92 42 7913064
 Email: mansoorshaker@yahoo.com
 Website: www.mgheng.com

Dealer/Distributor**PHILIPPINES****FIRE SOLUTIONS INC**

1028 Malaya Street, Malanday
 Marikina City, 1805 Philippines
 Tel: +63 2 371 9774
 Fax: +63 2 374 3041
 Email: firesolutions@skyinet.net

Dealer/Distributor**SINGAPORE****AZCEND ASIA PTE LTD**

Blk 21, Kallang Avenue #04-165
 Singapore 339412
 Tel: (65) 6299 0798
 Fax: (65) 6299 3735
 Email: rtiong@azcendasia.sg

Representative Office**SRI LANKA****BUILDING SERVICES (M&E) ENGINEER
INTERNATIONAL PVT LTD**

No. 20/39, Fairfield Gardens, Colombo 08, Sri Lanka
 Tel: +94 11 4717 500
 Fax: +94 11 2667 569
 Email: bldserv@sltnet.lk

Dealer/Distributor**TAIWAN****SUNMORN INC**

7F-2, 76, Nan Jing W. Road, Taipei 10352, Taiwan
 Tel: +886 2 2550 3500
 Fax: +886 2 2550 5350
 Email: merylyu@sunmoreinc.com
 Website: www.sunmoreinc.com

Dealer/Distributor**THAILAND****ANTI-FIRE CO LTD**

316-316/1, Sukhumvit 22 Road
 Klongtoey, Bangkok 10110, Thailand
 Tel: +66 2 260 4565
 Fax: +66 2 258 2422
 Email: sithichai@antifire.com
 Website: www.antifire.com

Dealer/Distributor**VIETNAM****EUROPEAN TECH JSC**

No. 50, 218/27, Lac Long Quan Street
 Tay Ho Dist., Hanoi, Vietnam
 Tel: +84 4 3755 7179
 Fax: +84 4 3755 7178
 Email: mscee@vnn.vn

Dealer/Distributor

FIRE FIGHTING ENTERPRISES

AUSTRALIA**AMPAC TECHNOLOGY PTY LTD**

7 Ledger Road, Balcatta, Western Australia 6021
 Tel: +618 9242 3333
 Fax: +618 9242 3334
 Website: www.ampac.net

Dealer/Distributor**BAHRAIN****KHAYBER TRADING COMPANY**

W.L.L, PO Box No. 1976, Cr.No. 40189-01
 Manama, Bahrain

Dealer/Distributor

CYPRUS**M.T. PIPERARIS TRADING LTD**

Nafpactou 19a, Lemesos 3051, Cyprus
Tel: +357 5 737311
Fax: +357 5 737310

Dealer/Distributor**ISRAEL****TELEFIRE FIRE & GAS**

Detectors Ltd, PO Box 7036
Petach-Tikva 49250, Israel
Tel: +972 3 9211955
Fax: +972 3 9211816

Dealer/Distributor**IRAN****NAR KOOB IRAN**

Apt 7, 3rd Floor, No 32, Varavini St.
Amir Atabak, St. Ostad Motahari Ave.
Tehran – Iran
Tel: +98 21 88842649
Fax: +98 21 88307405

Dealer/Distributor**KOREA****HI MAX CO LTD**

Sicox Tower, 115-Ho 513-14
Sangdaewon-Dong, Jungwon-Gu
Sungnam-City
Kyungki Do, Korea
Tel: +82 31 769 7698

Dealer/Distributor**MALAYSIA****FITTERS ENG SERV SDN BHD**

No.1 Block C, Jalan Dataran, Sd1 Pju 9
52200 Bandar Sri, Damansara
Kuala Lumpur, Malaysia
Tel: +60 3 62767155
Fax: +60 3 62758712

Dealer/Distributor**NEW ZEALAND****AMPAC INDUSTRIES LTD**

PO Box 100-149, North Shore Mail Centre
Glenfield, Auckland
Tel: +64 94438072
Fax: +64 94438073

Dealer/Distributor**QATAR****AL SHAIBEH ESTABLISHMENT**

PO Box 3975, Doha, Qatar
Tel: +974 4322140
Fax: +974 4416650

Dealer/Distributor**SINGAPORE****ACCLAIM SYSTEMS PTE LTD**

Blk 104, Boon Keng Road, 05-01
Singapore 339775
Tel: +656 2990 798
Fax: +656 299 3735

Dealer/Distributor**ALARM SUPPLY PTE LTD**

63 Jalan Pemimpin, 03-07
Pemimpin Industrial Bldg
Singapore 577219
Tel: 00 656 258 3445
Fax: 00 656 258 6428

Dealer/Distributor**SRI LANKA****FIRETECH (PVT) LTD**

34, Walter Gunasekara
Mawatha, Nawala, Sri Lanka
Tel: +94 1 806613
Fax: +94 1 806666

Dealer/Distributor**SYRIA****ESS COMPANY**

PO Box 35478, Damascus, Syria
Dealer/Distributor

TAIWAN**HORING LIH IND CO LTD**

4f No 18 Lane 327
Chung Shan Road
Sec 2 Chung-Ho-City
Taipei Hsien, Taiwan
Tel: +886 2224 87599
Fax: +886 2224 07752

Dealer/Distributor**THAILAND****TEEYA MASTER SYSTS CO LTD**

100/101-102 Vongvanji
Building B, 30th Flr
Rama 9 Road, Huaykhwang
Bangkok 10320, Thailand
Tel: +662 2 6451130
Fax: +662 2 2488540

Dealer/Distributor**UNITED ARAB EMIRATES****NAFFCO**

PO Box 17014, Jebel Ali Free Zone Area
Dubai, U.A.E
Tel: +971 4 881 5653
Fax: +971 4 881 6229

Dealer/Distributor**TELECTRON**

PO Box 2946, Al Salam Street
Bldg. No.5, Abu Dhabi, U.A.E
Tel: +971 26795333
Fax: +971 26794609

Dealer/Distributor

HOLMATRO RESCUE EQUIPMENT

AUSTRALIA**CHUBB FIRE SAFETY LTD**

120, Silverwater Road
Silverwater, NSW 2128
Locked Bag 102, Silverwater 1811
Contact: Andrew Loftus
Tel: 1300 369 309
Fax: 02 8748 7450
Email: firesafety@chubb.com.au
Website: www.chubb.com.au

Dealer/Distributor**BRUNEI****IECS SDN BHD**

13A Simpang 544-22
Jalan Jerudong
B.S.B. Brunei Darussalam
Contact: Roger Sim
Tel: +673 2 612 717
Fax: +673 2 612 720
Email: iecs.brunei@gmail.com

Dealer/Distributor**CHINA****HOLMATRO CHINA
UNIT 14/D – 9 JOY TOWER**

9 Zhen Ning Road
Shanghai 200050, P. R. China
Contact: Floris Evers
Tel: +86 21 5238 7330
Fax: +86 21 5238 7320
Email: china@holmatro.com
Website: www.holmatro-china.com

Representative Office**HONG KONG****ABLESLINK CO LTD**

Unit B4, 2/F., Block B
Sheung Shui Plaza
3 Ka Fu Close
Sheung Shui, N.T.
Hong Kong
Contact: Mr Randy Hau
Tel: +852-2466 4568
Fax: +852-2466 4569
Email: ableslink@yahoo.com

Dealer/Distributor**INDONESIA****PT ESA KARYA MANDIRI
JL.SUNTER PARADISE**

Timur Raya, F21 No. C42
Jakarta 14350
Contact: Mr Benny N Liem
Tel: 062-21-6412936/65303502
Fax: 062-21-6412937
Email: esakarya@cbn.net.id

Dealer/Distributor**JAPAN****AKAO & CO LTD**

4-13-1 Shinmachi Nishi-ku
Osaka
Japan 550-0013
Contact: Masaya Saga
Tel: +81-6-6532-6256
Fax: +81-6-6532-3095
Email: info@akao-co.co.jp
Website: www.akao-co.co.jp

Dealer/Distributor**KOREA (SOUTH)****KEO WHA HITEC CO LTD**

Rm-1F1, Jiwoo Bldg, 376-12
Seogyo-dong, Mapo-gu, Seoul, Korea
Contact: Mr Kenneth Zyung
Tel: 82-(02)-336-0145-7
Fax: 82-(02)-336-0180
Email: jfckenneth@yahoo.co.kr
Website: www.kh-hitec.com

Dealer/Distributor**MACAU SAR****TCT TRI-CONTINENTAL TRADING
COMPANY LTD**

4/F-“E”, Dynasty Plaza Bldg., 411-417
Ald. Dr. Carlos D'Assumpcao Macau S.A.R.
Contact: John Ferreira
Tel: +853 2875-0008
Fax: +853 2875-0007
Email: sales@tct.com.mo, john@tct.com.mo,
hanson@tct.com.mo
Website: www.tct.com.mo

Dealer/Distributor**MALAYSIA****PANDAN NIAGA SDN BHD**

No. 81A
Jalan Tabla 33/21
Shah Alam Technology Park
Seksyen 333
40400 Shah Alam
Selangor Darul Ehsan
Malaysia
Contact: Mohd Rashdi Abd Rahman
Tel: +603 5122 1310
Fax: +603 5122 1279
Email: pnsb@pn.com.my

Dealer/Distributor**NEW ZEALAND****CHUBB FIRE & SAFETY**

3 Fisher Crescent
Mt Wellington
Auckland
Contact: Steve Kirk
Tel: +64 9 270 7441
Fax: +64 9 270 7235
Email: fireandsafety@chubb.co.nz
Website: www.chubb.co.nz

Dealer/Distributor**PHILIPPINES****WALLGREEN INDUSTRIAL VENTURES
CORP**

62 West Avenue
Quezon City
Philippines 1104
Contact: Francisco C Dizon
Tel: +6 32 411 0818
Mobile: +6 32 0917 820 1947
Fax: +6 32 411 0818
Email: wivcor@yahoo.com

Dealer/Distributor

SINGAPORE**FABRISTEEL PRIVATE LIMITED**

9, Tuas Ave 10
Singapore 639133
Contact: Adros Sunan/Spencer Ong
Tel: +65 68623830
Fax: +65 68615988
Email: adros.sunan@fabristeel.com.sg
Dealer/Distributor

SRI LANKA**HALCHEM LANKA PVT LTD**

7, Siri Dhamma Mawatha, Colombo 10
Contact: Cyril Halloluwa
Tel: +94 11 5843213
Mobile: +94 777 315 375
Fax: +94 11 2674 615 and 2792 406
Email: sales@halchem-lanka.com
Website: www.halchem-lanka.com
Dealer/Distributor

TAIWAN**PARKSON TRADING CO LTD**

No. 50, 3F
Hua-Ning Rd, Guo Shan Dist.
80471 Kaohsiung City
Taiwan, R.O.C.
Contact: Mr Johnson Peng
Tel: +886-7-552-1650
Fax: +886-7-552-7999
Email: ptckpeng@parkson.com.tw
Dealer/Distributor

PACIFIC HELMETS**AUSTRALIA****PAC FIRE AUSTRALIA**

Unit 1, 28 Burnside Road
Hallmarc Business Park, Yatala
QLD 4207, Australia
Tel: +61-7-34421-7100
Fax: +61-7-3441-7177
Email: sales@pacfire.com.au
Website: www.pacfire.com.au
Representative Office

NEW ZEALAND AND ASIA-PACIFIC**(Excluding Australia)****PACIFIC HELMETS (NZ) LTD**

PO Box 866
315 Heads Road, Wanganui 5001
New Zealand
Tel: +64-6-344-5019
Fax: +64-6-344-5376
Email: sales@pacifichelmets.com
Website: www.pacifichelmets.com
Representative Office

**AUSTRALIA****ADA (AUSTRALIAN DEFENSE APPAREL PTD LTD)**

14 Gaffney Street
Coburg, Victoria 3058
Contact: Rob Walsh, Sales & Marketing Manager
Emergency Services
Tel: +61 3 9353 4552
Email: rob@ada.com.au
Website: www.ada.com.au
Garment Maker

BRUCK

Units 12/13
79-83 High Street
KEW Victoria 3101
Australia
Contact: Michael Smith
Tel: +61 4 0324 7309
Email: MSmith@Bruck.com.au
Approved PBI Weaver

LION APPAREL – ASIA PACIFIC

Asia Pacific – Protective Systems Group
Unit 3, 15 Dunstan Road, Wingfield
South Australia
5013 Australia
Contact: Warren Hoare, Regional Managing Director
Tel: +61 8 8139 7777
Email: warrenh@lionapparel.com
Garment Maker

PAC FIRE

Unit 1, 28 Burnside Road
Hallmarc Business Park, Yatala Qld 4207
Australia
Contact: Keith Ward, Managing Director
Tel: +61 7 3441 7100
Email: keith@pacfire.com.au
Garment Maker

STEWART & HEATON

150 Francisco Street
Belmont WA 6104 Australia
Contact: Brian Thomson, Business Development
Manager
Tel: +61 8 9277 5555
Email: brian.thomson@shcc.com.au
Garment Maker

CHINA**YINGTELAI TECHNOLOGY CO LTD**

76 Xihuan Road, ChangPing District
Beijing 102200, China
Contact: Xue Feng LIU, Vice Chairman General
Manager
Tel: +86 10 6974 2811
Email: xuefeng@yingtelai.com
Garment Maker

HONG KONG**WAH TAI ENTERPRISES LTD**

7/F Block F
Golden Bear Industrial Centre
66-82 Chai Wan KOK Street
Tsuen Wan N.T. Hong Kong
Hong Kong SAR
Contact: Johnny Ho, President, Special Products
Division
Tel: +852 2771 6360
Email: jho@wah-tai.com
Agent

KOREA**SEOJIN TEX**

Room 201 Kum Ho Building, Soongin-Dong
Jongro-gu Seoul, 110550
Korea (Republic of)
Contact: C J Yoon, Director
Tel: +82 22 253-7905
Email: seojintex@naver.com
Weaver

KOREA**SAN CHEONG COMPANY LTD**

185 Songmoon-Ri-Myun
Cheoin-Gu, Yongin-si, Gyeonggi-Do 449-823
Korea (Republic of)
Contact: Soo Youk Lee
Tel: +82 31 321 4077
Email: isu@sancheong.com
Website: www.sancheong.com
Garment Maker

SECURITON**ASIA PACIFIC****SECURITON (M) SDN BHD**

No. 19A, Lorong Rahim Kajai 13
Taman Tun Dr. Ismail, MY-60000
Kuala Lumpur, Malaysia
Contact: Mr Lewis Chong
Tel: +60 3 7725 1699
Fax: +60 3 7725 1677
Email: asia@securiton.com.my
Website: www.securiton.com
Representative Office

AUSTRALIA**AUSTRALIAN FIRE ENTERPRISES (AFE)**

PO Box 7027, Manning Park
NSW 2259, Australia
Contact: Mr Mike Donegan/Mr Brett Gordan
Tel: +61 2 43 592 244
Fax: +61 2 43 593 301
Email: sales@austfire.com.au/afe@ozemail.com.au
Dealer/Distributor

NATIONAL SECURITY & SURVEILLANCE

38 Lambert Street Richmond
Victoria 3121, Australia
Contact: Mr Dominic Paruit
Tel: +61 3 9428 8055
Fax: +61 3 9428 8065
Email: dominic.paruit@natss.com.au
Website: www.natss.com.au
Dealer/Distributor

CHINA, BEIJING**SECURITONG FIRE TECHNOLOGY LIMITED COMPANY**

Room 2101, Block 1, No. 58
East 3rd Ring South Road
Chaoyang Area
Beijing, China
Contact: Mr Gong Xinjun
Tel: +86 10 5867 2076
Fax: +86 10 5867 3319
Email: gxjbj@163.com
Dealer/Distributor

SWISS SECURITAS FIRE AND SECURITY SYSTEMS TECHNOLOGY (BEIJING) CO LTD

Room 1808-11
18th Floor Shouchuang Mansion
No.6 North Street
Chaoyangmen
Dongcheng Area
Beijing 100027, P.R.China
Contact: Mr Lewis Chong/Mr Todd Zeng
Tel: +86 10 6406 0558
Fax: +86 10 6406 6934
Email: todd.zeng@securiton.cn
Website: www.securiton.cn
Dealer/Distributor

BEIJING Z-N MECHANICAL & ELECTRICAL EQUIPMENT CO LTD

1 #B910,Lingdi Office
No.13 Beiyuan Lu
Chaoyang District Beijing
China 100012
Contact: Ms Sarah Zhang
Tel: +86 10 5207 3836
Fax: +86 10 5207 3839
Email: sarahzh@vip.sina.com/
bjzhongna@yahoo.com.cn
Dealer/Distributor

CHINA, SHANGHAI**BARTEC ELECTRIC (SHANGHAI) CO LTD**

New Building 7, No. 188
Xinjun Ring Road
Shanghai Caohejing
Pujiang Hi-Tech Park (Pudong Area)
Minhang District 201114
Shanghai P.R. China
Contact: Mr Banson Tang
Tel: +86 21 3463 7288 ext: 251
Fax: +86 21 3463 7282
Email: fanmin@bartec.com.cn
Website: www.bartec.com.cn
Dealer/Distributor

DEF CHINA

2nd Floor Building 135.
No.1421 East Zhuanxing Road
Minhang Area
Shanghai 201108
Contact: Mr François Yang
Tel: +86 21 3350 7133- +86 21 3350 8012
Fax: +86 21 3350 7285
Email: farech@sh163.net
Website: www.def-online.com
Dealer/Distributor

**SWISS SECURITAS (BEIJING) CO LTD
SHANGHAI COMPANY**

Room A, 23rd Floor Shimei Mansion
No. 445 Jiangning Road
Jing'an Area
Shanghai 200041
P.R.China
Contact: Mr Lewis Chong/Mr Todd Zeng
Tel: +86 21 5228 8111
Fax: +86 21 5228 8325
Email: todd.zeng@securiton.cn

Dealer/Distributor**SHANGHAI ZHENYE INDUSTRY CO LTD**

No. 3 221
Cao Bao L
Shanghai, 200233
Contact: Mr Jack Shen
Tel: +86 21 6451 2922/2933
Fax: +86 21 6451 9955
Email: sy1199@163.com
Website: www.shzhenye.com

Dealer/Distributor**CHINA, SHENZHEN****FANWO GROUP**

18F, China Economic and Trade Building
Zizhuqiao
Futian District
Shenzhen
China 518040
Contact: Dr Yao
Tel: +86 755 83222 076/+86 755 83222 872
Fax: +86 755 83222 311
Email: yaohaowei@gmail.com
Website: www.china-hrd.com

Dealer/Distributor**SHENZHEN YAOHUAJI CHINA CO LTD**

RM.F, 20th Floor Yong – Hui Building
Guo-Qi Building
Shenzhen
Contact: Mr Raymond Ng/Ms Shi
Tel: +86 755 8212 9831
Fax: +86 755 8212 9909
Email: rng@ywk.com.hk
Website: www.ywk.com.hk

Dealer/Distributor**HONG KONG****YIU WAH (KOGARAH) CO LTD**

Room 901
9th Floor
No 113 Argyle Street
Mongkok
Kowloon
Hong Kong
Contact: Mr Raymond Ng
Tel: +852 2781 1384
Fax: +852 2782 6652
Email: ywk@ywk.com.hk
Website: www.ywk.com.hk

Dealer/Distributor**INDIA, MUMBAI****BAJAJ ELECTRICALS LTD**

15/17, Sant Savta Marg
Reay Road
Mumbai – 400010
Contact: Mr Ravichandran Sr. (General Manager)
Tel: +91 22 2372 4192
Fax: +91 22 2373 0504
Email: bms@bajajelectricals.com
Website: www.bajajelectricals.com

Dealer/Distributor**VIMAL FIRE CONTROLS PVT LTD**

19/20 Vardhaman Service
Industrial Estate, L.B.S. Marg.
IN-400083
Vikhroli (West) Mumbai
India
Contact: Mr Vijay Doshi/Mr Nalin Doshi
Tel: +91 22 2578 3335
Fax: +91 22 2578 3338
Email: nalin@vimalfire.com/falgun@vimalfire.com
Website: www.vimalfire.com

Dealer/Distributor**HSE ENGINEERS PVT LTD**

2, Durgas Niwas, 1st Floor
Bhawani Tower Compound
Behind Bhawani Petrol Pump
IIT Powai, Mumbai 400076, India
Contact: Mrs Sapna Prajapati
Tel: +91 22 2578 7014 / 7015
Fax: +91 22 2578 7016
Email: hsemumbai@hseengineers.com
Website: www.hseengineers.com

Dealer/Distributor**KOREA (SOUTH)****ROYAL INDUSTRIAL TECHNOLOGY
CORPORATION**

Royal Building, 3rd Floor
840-5 Yeoksam-Dong
Kangnam-Ku
Seoul 135080, Korea
Contact: Mr E S Kim/Mr J K Chung
Tel: +82 22 009 1800
Fax: +82 2 567 8831
Email: kes@ritco.co.kr/jkchung@ritco.co.kr
Website: www.ritco.co.kr

Dealer/Distributor**MALAYSIA****FITTERS DIVERSIFIED BERHAD**

No. 1 Jalan Tembaga SD5/2
Sri Damansara
52200 Kuala Lumpur
Contact: Dato' Richard Wong/Mr K K Fong
Tel: +60 3 6276 7155
Fax: +60 3 6175 2780
Email: kkfong@fittersgroup.com
Website: www.fittersgroup.com

Dealer/Distributor**SYARIKAT LETRIK CHEN GUAN SDN
BHD**

Lot 1178 Jalan Subang 3
Taman Industri Sg.
Penaga, 47610 Subang Jaya
Selangor
Malaysia
Contact: Mr Choong Yew Lim
Tel: +603 5634 1436
Fax: +603 5634 2349
Email: chenguan@streamyx.com

Dealer/Distributor**PAKISTAN****EVERGREEN DEVELOPMENT
CORPORATION**

Suite # 514, 5th Floor
Clifton Centre
Block 5 Kehkashan, Clifton
Karachi 75600
Pakistan
Contact: Mr Munawar Afridi
Tel: +92 21 5873 448
Fax: +92 21 5870 080
Email: genco@cyber.net.pk
Website: www.edcpl.com

Dealer/Distributor**SINGAPORE****ACCLAIM SYSTEMS PTE LTD**

Blk 21 Kallang Ave # 04-165
Singapore 339412
Contact: Mr Michael Mok
Tel: +65 6299 0798
Fax: +65 6299 3735
Email: michael.mok@aspl.com.sg
Website: www.acclaim.sg

Dealer/Distributor**SWISS SECURITAS ASIA PTE LTD**

No. 56 Serangoon North Ave 4
#06-03, Singapore 555851
Singapore
Contact: Mr Andy Gan/Mr Michael Boon
Tel: +65 6853 8066
Fax: +65 6853 5939
Email: mike.boon@securitas.sg
Website: www.securitas.sg

Dealer/Distributor**TAIWAN****ATLAS TECHNOLOGY CORPORATION**

22F, No 1 Bausheng Road
Yunghe City
Taipei, Taiwan 234, R.O.C.
Contact: Mr David Liu
Tel: +886 2 223 20 556
Fax: +886 2 223 16 657
Email: david@atlasgroup.com.tw/
hunter@atlasgroup.com.tw
Website: www.atlasgroup.com.tw

Dealer/Distributor**KGIC TECHNOLOGY CO LTD**

No 36, Yingming 1st Road
Qianzhen District
Kaohsiung City 80649
Taiwan R.O.C.
Contact: Mr Franco Lee
Tel: +886 7 715 4285/+886 7 7715 829
Fax: +886 7 711 2811
Email: lic@ms9.hinet.net

Dealer/Distributor**UNIVERSAL PATHS DEVELOPMENT
CORPORATION (UPDC)**

9F-1, 306, Sec. 1, NeiHu Road
Taipei 114, Taiwan R.O.C.
Contact: Mr Terry Chung/Ms Ellie Chou
Tel: +886 2 8751 6055
Fax: +886 2 8751 6053
Email: ellie@updc.com.tw
Website: www.updc.com.tw

Dealer/Distributor**THAILAND****AEGIS FIRE SAFETY CO LTD**

19/9 Pechphirun Building 3rd Floor
Thetsabansongkhro Road
Ladyao, Chatujak, Bangkok 10900
Contact: Mr Quek Yong Siah
Tel: +66 2158 0338
Fax: +66 2158 0340
Email: ysquek@aegis-fs.com

Dealer/Distributor**FIRETRADE ENGINEERING CO LTD**

21/56 Soi Soonvijai, Rama IX Road
Bangkapi, Huaykwang
Bangkok 10320, Thailand
Contact: Mr Taksin Tantipijit
Tel: +66 2641 4707
Fax: +66 2203 0533
Email: taksin@firetrade.co.th

Dealer/Distributor**SEVO SYSTEMS****AUSTRALIA****FIRE PROTECTION TECHNOLOGIES**

Unit 14, 42-44 Garden Boulevard
Dingley, Victoria 3172, Australia
Tel: +61 3 9558 0715

Dealer/Distributor**HONG KONG****BEDFORD & COMPANY**

Unit 1, 7th Floor, Tai Ping Ind. Centre
Block 4, 51A
Ting Kok Road, Tai Poi
Hong Kong
Contact: Jackie Chow
Tel: 852 26623884
Fax: 852 26623877
Email: jcbedford@netvigator.com

Dealer/Distributor**MALAYSIA****SEVO SYSTEMS (M) SDN BHD**

No. 4A Jalan Kota Raja M27/M
HICOM Town Center, Seksyen 27
Shah Alam, Selangor 40400
Malaysia
Tel: 603 5192 9588
Email: hzin@sevosystems.com

Representative Office

PAKISTAN**MAB FIRE PROTECTION (PRIVATE) LTD**

24-C, South Park Avenue, Phase II, Extn. D.H.A.
Karachi, Sind 7550, Pakistan
Tel: 9221 5895298
Website: www.mabgroup.com.pk

Dealer/Distributor**SINGAPORE****CMA ENGINEERING SINGAPORE PTE LTD**

1, Yishun St. 23, #04-01 YS-One, Singapore
Singapore 768441
Contact: Christopher Lee
Tel: +65 6563 6860
Fax: +65 6563 2366
Email: chrisslee@cma.com.sg
Website: www.cma.com.sg

Dealer/Distributor**TAIWAN****COMLINK FIRE SYSTEMS**

6F No. 542, Sec.1, Minsheng N. Rd.
Queishan, Taoyuan, Taiwan 333 R.O.C.
Contact: Jack Wu
Tel: 011 886 3 2128590
Fax: 011 886 3 212 4450
Email: Jack-comlink@umail.hinet.net

Dealer/Distributor**AUSTRALIA****FIRE & RESCUE AUSTRALIA PTY LTD**

190 Main Rd, Blackwood, South Australia, 5051
Contact: Dale Thompson
Tel: +61 8 8370 2739
Fax: +61 8 8370 2738
Email: dale@fireandrescueaustralia.com

Dealer/Distributor**FIRE & SAFETY WA**

96 Furniss Rd, Landsdale, Western Australia, 6065
Contact: Kerry Lovett
Tel: +61 8 9302 3210
Fax: +61 8 9302 6110
Email: kerry.lovett@fireandsafetywa.com.au

Dealer/Distributor**SOLBERG ASIA PACIFIC PTY LTD**

PO Box 182, Kingswood NSW 2747, Australia
Contact: Ted Schaefer (Technical Manager)
Tel: 61 2 9673 5300
Email: ted@solbergfoams.com
Website: www.solbergfoams.com

Representative Office**MALAYSIA****RHINOSHIELD INDUSTRIES(M) SDN BHD**

H-0-5 Ground Floor Plaza Damas,
No. 60 Jalan Sri Hartamas 1, Sri Hartamas
50480 Kuala Lumpur, Malaysia
Contact: C K Lim (General Manager)
Tel: +603 62033850
Fax: +603 62032245
Email: rhinoshield@pd.jaring.my

Dealer/Distributor**SINGAPORE****CMA ENGINEERING SINGAPORE PTE LTD**

1, Yishun St. 23, #04-01 YS-One, Singapore 768441
Contact: Christopher Lee
Tel: +65 6563 6860
Fax: +65 6563 2366
Email: chrisslee@cma.com.sg

Dealer/Distributor**AUSTRALIA****GAAM EMERGENCY PRODUCTS**

29 Temple Dr.
PO Box 211
Thomastown
Victoria 3074
Australia
Tel: +61 3 9466 1244
Fax: +61 3 9466 4743
Email: iprice@tycoint.com
Website: www.gaam.com.au

Dealer/Distributor**HONG KONG****ROTTER INTERNATIONAL LTD**

Unit A G/F., Hung To Road
6-8 Hung To Road
Kowloon, Hong Kong
Tel: 85227517770
Fax: 85227562051
Email: jacky@rotter.com.hk

Dealer/Distributor**INDIA****FOREMOST TECHNICO PVT LTD**

M-1, Green Park Extension
New Delhi 110016, India
Tel: +91 (11) 2619 6982
Fax: +91 (11) 2616 6961
Email: foremost@hathway.com
Website: www.foremost-india.com

Dealer/Distributor**INDONESIA****PT PALMAS ENTRACO**

Jl. Krekot 85, Jakarta-Pusat, Indonesia
Tel: +62 (21) 384 1681
Fax: +62 (21) 380 2660
Email: sales@palmas.co.id

Dealer/Distributor**JAPAN****YONE CORPORATION**

23, Nishinakaai-Cho, Nishinokyo
Nakagyo-Ku, Kyoto 604, Japan
Tel: +81 (7) 582-11185
Fax: +81 (7) 580-12263
Email: t.yone@myad.jp
Website: www.yone-co.co.jp

Dealer/Distributor**KOREA (SOUTH)****SHILLA FIRE CO LTD**

433-11 Non Hon-Dong, Nam Dong-Gu
Inchon City 405-300
South Korea
Tel: +82-02-3665 9011
Fax: +82-02-3663 9113
Email: kofire77@hotmail.com
Website: www.firekorea.com

Dealer/Distributor**MALAYSIA****SENTRIX TECHNOLOGY SDN BHD**

No. 2A-2
1st Floor Jalan USJ 21/7
UEP Subang Jaya, 47630 Subang Jaya
Selangor Darul Ehsan
Malaysia
Tel: +603 8023-5228
Fax: +603 8023-5618
Email: chong@sentrrix.com.my
Website: www.sentrrix.com

Dealer/Distributor**NEW ZEALAND****TYCO SAFETY PRODUCTS**

6 Portage Road
New Lynn Auckland 0600
New Zealand
Tel: +64 9 826 1707
Fax: +64 9 826 1740
Email: sgurnick@tycoint.com
Website: www.tycosafetyproducts.com

Dealer/Distributor**PAKISTAN****FIRESTOP PVT LIMITED**

6/B, 1st Floor
Dinar Chambers
PO Box # 5786
West Wharf Road
Karachi-74000
Pakistan
Tel: 9221-2315675, 2313065
Fax: 9221-2310457, 5831015
Email: info@firestopaids.com
Website: www.firestopaids.com

Dealer/Distributor**PHILIPPINES****ALLIANCE INDUSTRIAL SALES**

Unit 4, Finlandia Town Homes
#1700 Dian
cor. Finlandia Street
Brgy, San Isidro, 1234 Makati City
Philippines
Tel: +63 21 7546 1749
Fax: +63 2 887 7173
Email: alliance8_jcy@pacific.net.ph

Dealer/Distributor**SINGAPORE****S.K. ROSENBAUER PTE LTD**

8 Tuas Drive 2
Singapore 638643
Singapore
Tel: +65 6862 3155
Fax: +65 6862 0273
Email: houchin@skrosenbauer.com
Website: www.skrosenbauer.com

Dealer/Distributor**TAIWAN****YONE CORPORATION**

23, Nishinakaai-Cho
Nishinokyo
Nakagyo-Ku
Kyoto 604
Japan
Tel: +81 (7) 582-11185
Fax: +81 (7) 580-12263
Email: t.yone@myad.jp
Website: www.yone-co.co.jp

Dealer/Distributor**THAILAND****ANTI-FIRE CO LTD**

316-316/1
Sukhumvit 22 Road
Klongtoey Klongtoey
Bangkok 10110
Thailand
Tel: +66 2259 6898
Fax: +66 2258 2422
Email: sithichai@antifire.com
Website: www.antifire.com

Dealer/Distributor**VIETNAM****TAN DUC JOINT STOCK COMPANY**

N15-16 D2 Street
Ho Chi Minh City,
Vietnam
Tel: 84838990678
Fax: 84838990698
Email: vntechdyn@hcm.fpt.vn
Website: www.tanducco.com.vn

Dealer/Distributor

SUBSCRIPTIONS

ASIA PACIFIC FIRE MAGAZINE

GET YOUR SUBSCRIPTION NOW!!!



**APF IS PUBLISHED 4 TIMES A YEAR
– MARCH, JUNE, SEPTEMBER
AND DECEMBER**

Name: _____

Company/Organisation: _____

Address: _____

Telephone: _____

Fax: _____

E-mail: _____

Start Subscription from Issue: _____

Subscription Rates: Sterling £50.00 AUS Dollars – \$100.00
US Dollars – \$70.00

Back Issues: US \$18.00, £10.00 or AUS Dollars \$20
each inclusive of P&P (subject to availability)

METHODS OF PAYMENT:

Website Subscription: www.mdmpublishing.com

Cheque: _____ MDM Publishing Ltd.

Visa/Mastercard No: _____

Expiry Date: _____ Security Code: _____
(last three digits on reverse of card)

If paying by credit card please fax details. DO NOT post/mail.
Fax: +44 (0) 1935 426926

MDM Publishing Ltd.

The Abbey Manor Business Centre, The Abbey, Preston Road,
Yeovil, Somerset BA20 2EN, United Kingdom

ADVERTISERS' INDEX

Argus Thermal Imaging	66
Bauer Compressors Asia Pte Ltd	44
Bio-Ex	59
Bristol Uniforms Ltd.	41
Bronto Skylift Oy	46
Bullard Asia Pacific Pte Ltd	67
China Fire 2010	02
Coltri Asia Pacific	41
Control Logic s.r.l.	25
Cutters Edge	17
Dafo Fomtec AB	64
Draeger Safety Asia Pte Ltd.	OBC
Dr. Sthamer Hamburg	31
DuPont Fire Extinguishants	50
Dynax Corporation	26
Elkhart Brass Mfg Co Inc	60
Fike Corporation	55
Fire Fighting Enterprises	23
Fire Fighting Foams Coalition	11
Firetrace International	32
Holmatro Rescue Equipment	58
IFSEC India 2010	36
Lukas Hydraulik GmbH & Co. KG	56
NFPA	04
Pacific Helmets (NZ) Ltd.	15
PBI Performance Products, Inc.	IBC
Plastika Akrapovic	42
Rosenbauer International AG	49
Securiton AG	23
Sevo Systems, Inc.	53
Simulation Ltd	45
Solberg Asia Pacific Pty. Ltd.	29
Super Vacuum Manufacturing Inc.	39
Task Force Tips, Inc.	IFC
Texas A & M Emergency Services Training Institute	38
Unifire, Inc.	8
W.S. Darley Inc.	19
Xtralis Pty Ltd.	20
Ziamatic Corporation	69



Proudly Saluting Hong Kong Fire Service for Adopting PBI.

PBI Matrix®... The Power Grid.



Better performance, better comfort and better value in outer shell protection. PBI Matrix takes PBI's proven protective characteristics of unmatched flame and thermal protection to another level by reinforcing them with a unique grid of high strength aramid filament fiber — for unsurpassed performance and durability. Tough and rugged, PBI Matrix responds call after call and remains service worthy by providing increased resistance to rips, tears and abrasions. This revolutionary outer shell is lightweight, fast drying, and offers superior comfort and reliability. More than just premium protection, it's a valuable asset in your fire fighting arsenal...PBI Matrix. What else would you expect from the people who set the standard for unmatched personal protection and performance...PBI Gold®, PBI Matrix® and PBI TriGuard® see the difference.

PBI Performance Products, Inc. // 9800 Southern Pine Blvd Suite D // Charlotte, NC 28273 // 800-858-2467 // pbiproducts.com

22 Mallard Way // Pride Park // Derby DE24 8GX UK
T +44 (0) 1332 290466 // F +44 (0) 1332 290952
E-mail: ian.callaghan@pbiproducts.com

Im Gewerbepark D23 // D-93059 Regensburg, Germany
T +49 (0) 941 465 275 9-9 // F +49 (0) 941 465 275 9-8
E-mail: helmut.zepf@pbiproducts.com

PBI Gold, PBI Matrix and PBI TriGuard are registered trademarks of PBI Performance Products, Inc. © 2010. All rights reserved.



00:00:00

00:00:03

**The new Dräger HPS 6200:
with Q-Fix, giving a quick and secure mask attachment.**

Protect your head with just a single click: with the Dräger HPS 6200 full-shell helmet, attaching your mask takes seconds. A single hand movement is all it takes using the Q-Fix mask attachment system, developed by Dräger, to secure your mask in place.

The Dräger HPS 6200 is currently the lightest EN 443:2008-compliant helmet approved for category B use on the market today. It has been developed in close collaboration with our customers and is produced by Dräger at our own manufacturing facilities. The benefits are clear to see: a contemporary design and new levels of safety and comfort, all combined to provide head protection that is nothing short of superb. To find out more about the Dräger HPS 6200, visit www.draeger.com/hps6200

APF

An MDM PUBLICATION
Issue 36 - December 2010

www.mdmpublishing.com

ASIA PACIFIC **FIRE** MAGAZINE

REPORTING TO THE ASIA PACIFIC FIRE PROTECTION AND FIRE SERVICE INDUSTRY

TASK FORCE TIPS, INC.



3701 Innovation Way, Valparaiso, IN 46383-9327 USA
International +1.219.548.4000 • www.tft.com • intsales@tft.com

QuadraCup

Selectable Foam Nozzle

110, 230, 360 & 470 l/min
38 mm Coupling



The TFT QuadraCup is a rugged and dependable selectable gallonage nozzle with a retractable foam aspiration sleeve. When the outer sleeve is in the retracted position, the nozzle operates the same as the TFT QuadraFog. Flow can be set to any one of four settings, or to a flush mode. The front end can be rotated from straight stream through wide fog patterns. Uniquely cut fixed metal fog teeth produce a wide range of fog patterns. Available in either tip-only configuration or with a stainless ball shutoff, the QuadraCup is also available with optional colored pistol grip and handle covers (NFPA 1901 (A.16.9.1)).

QuadraFog Selectable Liter Nozzle



Stainless Steel Fog Teeth

Fog Teeth made from 316 stainless steel offer enhanced resistance to damage and increased corrosion resistance. Strong equipment designed to last a long time in harsh environments.

110, 230, 360 & 470 l/min
Selectable Nozzle
Fixed or Spinning Teeth

Top Quality Material

With one heavy duty Stainless Steel ball valve to shutoff the nozzle you get a 100% reliable and low maintenance unit.

NFPA 1964
Compliant

For excellent quality fire fighting equipment visit www.tft.com and call your local distributor for a demonstration. Display equipment, literature and digital data can be obtained by contacting your trained TFT distributor.



AUSTRALIA

Gaam Emergency Products-AU
Phone : 61394661244
Fax : 61394664743
iprice@tycoint.com
www.gaam.com.au



INDONESIA

Pt Palmas Entraco
Phone: +62 (21) 384 1681
Fax: +62 (21) 380 2660
sales@palmas.co.id



NEW ZEALAND

Tyco Safety Products
Phone: 6445608127
Fax: 6498270844
tsp.sales.nz@tycoint.com
www.tycoservices.co.nz



SOUTH KOREA

Shilla Fire Co., Ltd.
Phone: 820236659011
Fax: 820236639113
kofire77@hotmail.com
www.firekorea.com



HONG KONG

Rotter International Ltd.
Phone: 85227517770
Fax: 85227562051
jacky@rotter.com.hk
www.rotterbiz.com



JAPAN / TAIWAN

Yone Corporation
Phone: 81758211185
Fax: 81758012263
t.yone@myad.jp
www.yone-co.co.jp



PHILIPPINES

Alliance Industrial Sales
Phone: 6328908818
Fax: 6328960083
alliance8_jcy@pacific.net.ph



THAILAND

Anti-fire Co., Ltd.
Phone: 66 2 259-6898
Fax: 66 2 258-2422
sithichai@antifire.com
www.antifire.com



INDIA

Foremost Technico Pvt Ltd
Phone: +91 (11) 2619 6982
Fax: +91 (11) 2616 6961
foremost@hathway.com
www.foremost-india.com



MALAYSIA

Sentrix Technology Sdn Bhd
Phone: +603 8023-5228
Fax: +603 8023-5618
chong@sentrix.com.my
www.sentrix.com.my



SINGAPORE

S.K. Fire Pte. Ltd.
Phone: 6568623155
Fax: 6568620273
houchin@skfire.com
www.skfire.com



VIETNAM

Tan Duc Joint Stock Company
Phone: 84-88990 678
Fax: 84-88990 698
techdyn@hcm.fpt.vn

www.tft.com

**December 2010
Issue 36**



Front Cover Picture: Firefighters walk near an oil pipeline blast site in Dalian, Liaoning province early morning July 17, 2010. REUTERS/China Daily

Publishers
Mark Seton & David Staddon

Group Editor
Graham Collins

Editorial Contributors
Jim Shannon, Ted Schaefer, Bogdan Z. Dlugogorski, Eric M. Kennedy, Alison Aprhys, Graham Collins, David Goodrich, Haukur Ingason, Scott Starr, Rick Love, Rolf Sterbak, Cody Harris

APF is published quarterly by:
MDM Publishing Ltd
The Abbey Manor Business Centre,
The Abbey, Preston Road, Yeovil,
Somerset BA20 2EN, United Kingdom
Tel: +44 (0) 1935 426 428
Fax: +44 (0) 1935 426 926
Email: mark.seton@apfmag.com
Website: www.mdmpublishing.com

©All rights reserved

Subscription Rates
Sterling – £50.00
AUS Dollars – \$100.00
US Dollars – \$70.00
(Prices include Postage and Packing)
ISSN – 1476-1386

DISCLAIMER:
The views and opinions expressed in ASIA PACIFIC FIRE MAGAZINE are not necessarily those of MDM Publishing Ltd. The magazine and publishers are in no way responsible or legally liable for any errors or anomalies made within the editorial by our authors. All articles are protected by copyright and written permission must be sought from the publishers for reprinting or any form of duplication of any of the magazines content. Any queries should be addressed in writing to the publishers.

Reprints of articles are available on request. Prices on application to the Publishers.

Page design by Dorchester
Typesetting Group Ltd
Printed in the UK

Contents



15-20



23-27



39-40



43-44

03 From the Editor

05 NFPA Foreword

06-12 News &
Product Profiles

15-20 Know Your
Foams

23-27 CFA Wildfire
Fire Fighter Training

29-30 Christchurch
Earthquake - A Lesson
in USAR

33-37 Fire
Suppression - Keep It
Clean

39-40 Bushfires -
A Vision of the Future

43-44 CBRN -
Protecting the
Protectors

47-50 Tunnel Fire
Safety - Assessing the
Risk

53-55 Protect What
Really Counts

57-59 The Growing
Role of Voice in Fire
Safety

60-61 Danger Made
Visible

62-63 White Water
Rescue - Getting the
Right Gear

64-71 Distributor &
Representative Office
Listing

72 Advertisers' Index



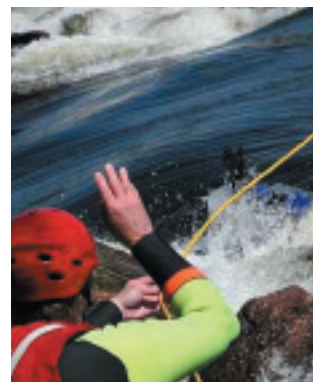
47-50



53-55



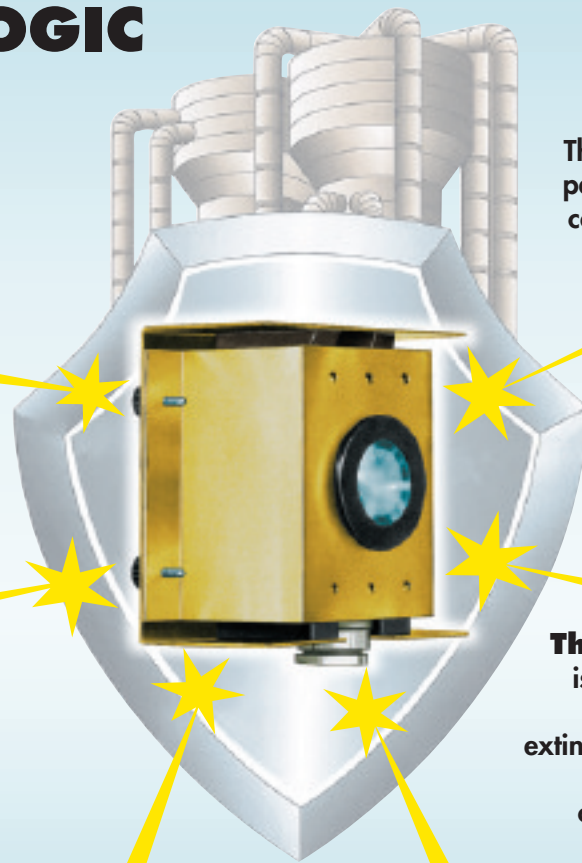
57-59



62-63

CONTROL LOGIC Spark detector

designed for
dust collection
systems
to protect
storage silos
from the risk
of fire.



**Sparks fly
at high speed.**

They travel at a hundred kilometres per hour along the ducts of the dust collection system and reach the silo in less than three seconds

The CONTROL LOGIC SPARK DETECTOR

is faster than
the sparks themselves.
It detects them with its highly
sensitive infrared sensor,
intercepts and extinguishes
them in a flash.
It needs no periodic inspection.

The **CONTROL LOGIC system**
is designed for "total supervision".
It verifies that sparks have been
extinguished, gives prompt warning of
any malfunction and, if needed,
cuts off the duct and stops the fan.

ISO 9001

20137 Milano - Via Ennio, 25 - Italy
Tel.: + 39 02 5410 0818 - Fax + 39 02 5410 0764
E-mail: controllogic@controllogic.it - Web: www.controllogic.it



CONTROL LOGIC s.r.l.



**IR FLAME DETECTOR
RIV-601/FA
EXPLOSIONPROOF
ENCLOSURE**

For industrial applications indoors
or outdoors where is a risk of explosion
and where the explosionproof
protection is required.
One detector can monitor a vast area
and responds immediately
to the fire, yet of small size.

BETTER TO KNOW IT BEFORE

Eye is faster than nose.

In the event of live fire
the IR FLAME DETECTOR
responds immediately

CONTROL LOGIC IR FLAME DETECTOR

the fastest and most effective fire alarm device
for industrial applications

Also for

RS485 two-wire serial line



**IR FLAME DETECTOR
RIV-601/F
WATERTIGHT
IP 65 ENCLOSURE**

For industrial applications indoors
or outdoors where fire can spread
out rapidly due to the presence of
highly inflammable materials,
and where vast premises need an optical
detector with a great sensitivity
and large field of view.

ISO 9001

20137 Milano - Via Ennio, 25 - Italy
Tel.: + 39 02 5410 0818 - Fax + 39 02 5410 0764
E-mail: controllogic@controllogic.it - Web: www.controllogic.it



CONTROL LOGIC s.r.l.



By **Graham Collins**

Things To Come?

Recently, the Commission for the Prevention of Weapons of Mass Destruction Proliferation and Terrorism set up by the US government came to a chilling conclusion. In a report it stated: "Unless the world community acts decisively and with great urgency, it is more likely than not that a weapon of mass destruction will be used in a terrorist attack somewhere in the world by the end of 2013."

And the commission's is not a lone voice. The US's Director of National Intelligence publicly agreed with the report's threat assessment, saying "we (the intelligence community) assess biological as the more likely and it is better than an even chance in the next five years that an attack by one of those weapons systems will be conducted in some place on the globe..."

We can, of course, hope that the report and those agreeing with its findings are wrong, but we should prepare for the worst. This means ensuring that CBRN (chemical, biological, radiological and nuclear) first responders, and those working in USAR (urban search and rescue) have the finest training and the best available equipment. We should also strive to work together, not merely to eradicate this threat, but to ensure that the sharing of experience, techniques and best practice is not hindered by national boundaries. After the event will be too late.

Significantly, in this edition of Asia Pacific Fire we have an article on protecting firefighters from the CBRN threat; another article is on how firefighters in New Zealand's USAR teams dealt so successfully with the aftermath of the Christchurch earthquake. We will undoubtedly be returning to these subjects during 2011.

Also in this edition is an article on clean agents that, hopefully, sets the scene for an APF exclusive article that will appear in the next edition, written by John O'Sullivan, on the 2010 version of the UNEP (United Nations Environment Programme) Technical Report on Fire Agents. John was involved in writing the report and was

the 2010 recipient of the NFPA's Paul C. Lamb Award, the first time the honour has gone outside North America. Also on the topic of fire suppression is an article on foams that provides clarity to the current confusion surrounding firefighting foam technology. The article helps to bridge the information gap of the last eight years and overviews firefighting foam technology as it is today.

Also on the topic of fire suppression, we have taken a close look at critical asset fire protection. This is particularly timely following the recent announcement on the potential lack of availability of one of the leading gaseous agents and the implications this has in terms of cost. The article argues the case for providing dedicated fire detection and suppression to those assets and elements of a building that are critical to the organisation's ability to continue trading.

Finally, with the bushfire season coming around again we have included two particularly relevant articles. The first is from Victoria CFA that gives the expert's view on bushfire firefighter training. The second article takes a close look at an innovative bushfire smoke detection system that has been trialled in Victoria and has already been adopted successfully in several European countries.

Our next edition of the magazine will, in addition to John O'Sullivan clean agent article, cover a host of topics as varied as storage tank fire protection and gas detection, ARFF vehicles and firefighter communication, hoses, nozzles, beacons and sounders.

APF



MEMBERSHIP



Up-To-Date? It's Up to You!

NFPA® membership is indispensable for more than 81,000 professionals worldwide. What about you? It's an easy decision for anyone involved with protecting people and property, because NFPA keeps members on top of breakthroughs, research, and technology...and in control of their careers. **Join now and SAVE 10%** on NFPA codes, products, and seminars, while **you stay up-to-date** with:

- **NFPA Journal®**, the award-winning bimonthly membership magazine loaded with articles, codes and standards information, investigations, case studies, and reports
- Answers to your code questions from NFPA's experienced fire protection specialists
- Online issues of **NFPA News** for codes and standards activities, and **NFPA Update** for training opportunities and events
- FREE membership in any of 16 industry-specific sections including Fire Service; Building Fire Safety Systems; Health Care; Electrical; and Architects, Engineers, and Building Officials
- The latest **NFPA Journal Buyers' Guide**—your bonus gift valued at \$40

Gain a decided advantage on the job. Join NFPA today!

Become part of the world's largest organization for fire, electrical, and building safety professionals and stay up-to-date for only \$150 annual dues—satisfaction guaranteed.

**To join call 1-617-770-3000, or visit
nfpacatalog.org.**



By Jim Shannon

NFPA President & CEO

Foreword

NFPA and the world

Over the past month, I travelled to China and Portugal. Both visits were important illustrations of NFPA's increasing reach. Because of the transformation of global communications, we have seen the awareness of NFPA, our codes, standards, education programs, and now advocacy campaigns grow rapidly all over the world, and we are adjusting our international strategy to take advantage of these new opportunities to advance our mission.

For decades we have worked successfully to achieve greater acceptance of NFPA codes and standards around the world. One example is the adoption and use of the National Electrical Code throughout Latin America. The growth of NFPA Chapters in the region has greatly improved our effectiveness by bringing together highly trained users and advocates of NFPA codes and standards to support our code adoption efforts.

In Colombia, one of our earliest international alliances was established with OPCI (Ibero-American Organization of Fire Protection). Its founder, Jaime Moncada, became a member of the NFPA Board of Directors and provided insight and guidance as we expanded our international activities. We have similar relations with IRAM,

translated and in use there, including NFPA 10, Life Safety Code; NFPA 7, National Fire Alarm and Signalling Code; and NFPA 13, Installation of Sprinkler Systems. We also have a close partnership with the Korean Fire Protection Association.

Our education and advocacy campaigns have also brought about exciting opportunities for international cooperation. From the beginning of our successful fire-safe cigarette campaign, we collaborated closely with international allies. Canada was a leader in gaining national adoption, and Australia had already been pushing this technology by the time we launched our campaign. We are sharing the lessons learned from our fire-safe cigarette success with our colleagues in Europe, and we expect this to become a European requirement within the next

Our education and advocacy campaigns have also brought about exciting opportunities for international cooperation. From the beginning of our successful fire-safe cigarette campaign, we collaborated closely with international allies.

the national standards body of Argentina, and other organisations in Latin America.

In Lisbon, the NFPA-APSEI Fire & Security 2010 event included lively discussions and training on the most challenging issues in fire and life safety, and NFPA codes and standards topics were a critical component.

In the People's Republic of China, our full-time representative, Liu Yuanjing, has spearheaded our work to bring about more use of NFPA codes and standards. We have worked closely with the China Fire Protection Association and the nation's fire service, which has a strong interest in using NFPA standards. At the request of Ministry of Public Security, we have given permission for the translation of NFPA Codes and Standards into Mandarin, and a number of our documents are

couple of years. I also met with top fire officials in China about fire-safe cigarettes on my recent visit. There are opportunities to introduce safety improvements there on a large scale, and while we will continue to push for the use of NFPA Codes and Standards, we will also encourage the government to embrace other life-saving measures.

We are building similar alliances in support of residential sprinklers. I have spoken to public-interest sprinkler supporters in London, and at meetings with residential sprinkler advocates throughout the U.K.

NFPA is proud of its long history in reducing the burden of fire and other hazards. All of this work is helping us further that mission across the world.

APF

Cleared for Take-off

Business continuity at India's Delhi Airport's new Terminal 3 has been given a boost with the installation of a VESDA by XTRALIS aspirating smoke detection (ASD) system to provide early fire detection within the baggage handling, retail and check-in areas.

The new terminal has the capacity to handle 34 million passengers a year, with eight levels 28 meters above the ground spread over four square kilometres. It boasts more than 90 automated walkways and 78 aerobridges, and is rated as the eighth largest airport in the world and the largest public building constructed in India since Independence in 1947.

The reasons given for selecting the Vesda system included its ability to protect large, open spaces where smoke will be diluted; an effect that can be exacerbated by air-conditioning systems. Vesda continuously samples air to detect even the smallest smoke particles, so preventing a small fire from developing into a major incident. It buys time to investigate an alarm and initiate an appropriate response to prevent injury, property



damage or business disruption.

Due to the high sensitive of the Vesda detectors and their pipe networks, which have multiple sampling points, they can be placed where smoke is most likely to travel

and are particularly adept at detecting diluted smoke.

For more information go to www.xtralis.com/delhiairport

Wellington Hospital, New Zealand Detection

More than 1300 APOLLO analogue addressable fire detection devices, including products from the company's XP95 and Discovery ranges, have been installed as part of a major refurbishment and redevelopment of the Wellington Regional Hospital in New Zealand. The hospital is country's main tertiary hospital, providing specialist and acute services including cardiac surgery, cancer care and neurosurgery. It is also the region's



primary emergency and only trauma service.

All of the Apollo detectors used at Wellington Hospital are equipped with a purely mechanical device called an XPert card, which differs from many addressing systems by storing the address in the detector base and not the detector itself. The card uses a series of pips to operate switches in the detector head when it is fitted. This, says Apollo, has the advantage of ensuring that the address stays assigned to one location and does not need reprogramming in the event of maintenance or detector replacement.

The Apollo devices at the Wellington Hospital are controlled by nine Ampac Firefinder control panels, which are supported by Ampac's own graphics package to allow networking into the various buildings on the site.

For more information go to www.apollo-fire.co.uk

Study Confirms Pipe and Fitting Environmental Performance

An ISO-compliant, peer-reviewed life cycle assessment (LCA), conducted by Environmental Resources Management Limited, comparing the environmental impact of BLAZEMASTER fire sprinkler pipe and fittings with steel pipe and fittings showed that BlazeMaster is the more sustainable choice.

The detailed study covered a number of environmental impacts including: metal depletion; fossil depletion; terrestrial acidification; freshwater eutrophication; climate change; ozone depletion; human toxicity; freshwater ecotoxicity; photochemical oxidation; terrestrial ecotoxicity; water depletion and energy consumption (both non-renewable and renewable energy use). BlazeMaster's score exceeded – in some cases, dramatically – steel in 12 of the 13 categories in what has been described as a "cradle-to-grave" study.

For more information go to www.blazemaster.com

AquaFlex Sprinkler Fittings Range Launched



VICTAULIC has launched its AquaFlex stainless-steel sprinkler fitting range in India, with claims that it offers fast and dependable installation, durable performance and cost effectiveness for maintenance and retrofit application. The company also asserts that the range requires fewer man hours to install, lowers shipping costs, and is easier to

position than rigid piping.

AquaFlex is aimed at commercial suspended and hard ceilings and for round or square duct work to provide fire protection where combustible gasses may be present. The fittings are available in two different types – an FM (Factory Mutual) approved braided system and an unbraided system (cULus 2443 Listed), with system availability depending on region and on application.

The range comes preassembled and comprises a flexible stainless-steel hose available in 790mm to 1830mm lengths, a reducer for connecting the sprinkler, and a branch nipple for attachment to the piping system.

An installation-ready bracket is also included when ordered as a kit. The new offering also includes a patent-pending, installation-ready bracket that is said to install up to five times faster than any competitive bracket technology. The new bracket enables three positioning of the sprinkler and secures mounting to the ceiling grid without tools, allowing instant, centre-of-tile sprinkler positioning. A number of optional accessories are also available.

For more information go to www.victaulic.com/aquaflex

Hand-Held Portable Boosts Safety



A hand-held portable radio incorporating a new Lifeguard feature – also known as man-down – that can be activated with one key press has been unveiled by CASSIDIAN. When a user activates Lifeguard, the radio automatically sends a message to a predetermined number. If the radio stops moving or remains horizontal for too long, it triggers a local man-down alert. If the user does not respond, the radio automatically activates an emergency call and sends its coordinates to a predefined destination over the Tetra network.

IP65 protection gives the new THR9i hand-held resistance to dust and water, while its metallic chassis and the new front cover design protect it against shocks. The large QVGA (Quarter Video Graphics Array) displays information clearly, enabling it to capture mission critical data at a glance. Key features of the radio include clear sound and an excellent audibility for voice calls, even in noisy environments. A GPS-based “where are you” feature shows on the radio display during a call, and it is possible to save these locations as waypoints for later use.

The THR9i can receive and host applications that can be customised to meet specific needs, and a terminal management tool allows several radios to be updated and re-configured simultaneously. It comes with a wide range of audio accessories, a car kit with an automatic connection to an external antenna, and two battery options.

For more information go to www.cassidian.com

Blowing In The Wind



A new fan weighing just 20 kg has been introduced by RAMFAN. The LG200 PPV Turbo Blower is cited as generating 20,000 m²/hr with 56 percent less carbon monoxide than comparable gas-powered ventilation fans. It is designed to be carried one-handed anywhere on the fireground, even to upper floors in high-rise buildings.

The LG200's performance is the result of an ultra-compact, two-hp Honda engine that features 50 percent greater air intake and Ramfan's PowerShroud™ technology; a combination of fan and stationary blades that turn spinning airflow into a straight, tightly-focused blast of air.

For more information go to www.euramcosafety.com

ARFF Vehicles Boost Airport's Safety

OSHKOSH Airport Products Group has delivered 24 Oshkosh Striker ARFF (Aircraft Rescue and Fire Fighting) vehicles to the Pakistan Civil Aviation Authority (PCAA). At a formal signing and acceptance ceremony in Karachi, Pakistan, it was also announced that 19 more Striker vehicles have been ordered by the PCAA for delivery in 2011.

The Strikers will be stationed at civil airports throughout Pakistan, the largest of which is Jinnah International Airport in Karachi that handles six million passengers a year. The contract terms include on-site operational and maintenance training, auxiliary equipment and spare parts.

For more information go to www.oshkoshairport.com



New Linear Heat Detection

VIMPEX has launched the Signeline range of linear heat detection systems; heat sensing cables that are conventional heat detectors in a linear form, providing early detection of fire conditions or overheating of equipment, plant or the surrounding area.

The cables sense heat anywhere along their length and are designed to be used in commercial and industrial applications, such as cable trays, plant rooms, car parks, conveyors, tunnels and marine engine rooms. They are very cost effective, easy to install and are maintenance free. They can also be used in intrinsically safe areas and dusty or harsh environments down to minus 40°C. Two types of Signeline linear heat detection cable are available; fixed temperature Signeline FT, and analogue Signeline HD.

Signeline FT is available in three different alarm temperatures, 68°C, 88°C and 105°C. All are UL Listed and FM approved and have two outer cover options. A high temperature cable of 178°C is also available to provide a full range of fixed temperature heat sensing cables. They can be used as a standalone system or connected to any conventional control panel covering up to 3 kilometres in a single zone. An optional alarm point distance locating (APDL) device can be installed between



a fire alarm control panel or addressable module and a single length of Signeline FT heat sensing cable to display the distance to the alarm point.

Signeline HD is an analogue heat sensing cable that monitors significant increases in temperature and provides an early warning of fire. The cable is fully resettable and is VdS approved to EN 54-5:2001 and EN 54-17:2001. The Signeline HD cable works in conjunction with a controller and end of line unit, which enables the cable to be fully monitored for open and short circuits. The controllers are equipped with volt-free fire and fault relays that are connected to the fire alarm control panel via a simple interface unit. Alternatively the controller can be used as a standalone device using the relay contacts to activate subsidiary equipment.

For more information go to www.vimpex.co.uk

New Manual Monitor Unveiled

A new manual monitor has been added to the AKRON BRASS offering of manual and electric water cannons. Described by the company as compact, high performing and cost effective, the Style 3430 monitor is rated for flows up to 3800 litres-a-minute and offers continuous 360 degree rotation.



The new monitor has a rugged, lightweight design – it weighs just seven kilograms – and features a “T” dual-handle tiller bar design for maximum control and precise positioning with an elevation range of +90° to –45°, has a built-in pressure gauge, requires minimum mounting space, and is said to be ideal for all your master stream firefighting needs. It incorporates cast-in turning vanes and an integrated stream shaper for maximum reach and stream performance.

For more information go to www.akronbrass.com

Protective Cases and Lighting

PELICAN PRODUCTS is the global leader in the design and manufacture of advanced lighting systems and virtually indestructible cases. Following the acquisition of Hardigg Industries, the largest manufacturer of rotationally moulded shipping containers, the company now offers the world's most diverse group of protective case and lighting solutions for harsh environments.

Pelican advanced area lighting systems and torches

Pelican advanced lighting solutions are preferred by professionals who work in extreme conditions across the globe. From NVG-compatible and IR lights, intrinsically safe torches, headlamps and rescue lights, to rugged Xenon and LED submersible work lights, Pelican's extensive array of advanced lighting tools (almost 60 models) has a lighting solution for every incident.



Pelican remote area lighting systems (RALS)

RALS are fully portable, powerful, rechargeable, energy-efficient and environmentally responsible floodlighting solutions – accessible for places where vehicles and fuel-powered generators are not.



The 9440 RALS features ten next-generation LEDs and a beam spread of 120 degrees that effectively lights a large area. Additionally, it offers two brightness settings that shine 2,400 lumens for three hours in high-setting and 1,200 for six hours in low. The light is powered by the latest, maintenance-free, nickel metal hydride rechargeable battery. As a result, it runs silent and has no power cord, which eliminates trip-hazards and emits no toxic fumes like bulky inefficient fuel-powered lights.

Setting up in seconds, and weighing in at a mere seven kilograms, the 9440 RALS is built with a streamlined, self-deploying tripod for easy site placement and a nylon shoulder strap for simple transport. The 9440 RALS also features a telescoping light tower that extends more than two metres and a light array that articulates 90 degrees.

Pelican cases

Built with engineering-grade polymers, Pelican Cases are the toughest on the market and offer over 50 models that can protect sensitive

equipment of all sizes. Standard features include lids equipped with polymer o-rings for a dust/water-resistant seal and two dual-action latches that have been tested to withstand nearly 180 kilograms of pressure (but open with a light pull), lockable, dustproof, crushproof, and with integrated automatic pressure equalization valves that keep moisture out and prevent vacuum lock, ensuring cases are easier to open at any altitude. Genuine Pelican Cases are fully stackable for optimal space efficiency and can always be spotted by their distinctive, trademarked "Dual Band" design.

Pelican ISP cases

Shifting loads and loose cargo are not a problem for Pelican-Hardigg inter-stacking pattern (ISP) cases. Designed to stay secure in transit, ISP cases are engineered with patent-pending "wave design" stacking ribs (on their lids) and moulded in-discs (on their bottoms) that work in tandem to lock the cases together in a stack. The integrated wave design also allows for easy cross-stacking across all six models in the group and enhances their rotationally moulded polymer construction's load bearing properties.

Pelican storm cases

Engineered for extreme, military and industrial applications, Pelican Storm Cases are built from Pelican's patented HPX high-performance resin that makes them lightweight, and virtually indestructible. With 23 models to choose from, all Pelican Storm Cases feature the company's unique, durable press-and-pull latches, which open smoothly – yet hold fast when the case is taking a beating.

APF

For more information go to
www.pelicanaustralia.com

Beam Detector Is Auto-Aligned

A conventional auto-aligning beam detector with laser alignment has been added to APOLLO Fire Detectors' range of fire detection products.

Specifically designed to detect smoke in large, open areas such as warehouses, hangars, theatres, churches and sports centres, it has a range of eight metres to 100 metres.

During installation, a visible laser is used for initial alignment of the beam. An automatic, motorised auto-alignment feature then ensures that the beam remains on target, counteracting the effects of building movement. Automatic optimisation



technology also compensates for dust build-up on the lens, ensuring false alarms are avoided and the system continues to work effectively over time. Up to four detectors can operate from one single low-level controller, minimising installation costs and allowing full control of the detector heads without the need for expensive lifting gear.

The product has worldwide approvals including EN54:12 and can be loop-powered using a switch monitor or mini switch monitor, enabling it to be added on as an extension to existing Apollo analogue addressable systems.

For more information go to www.apollo-fire.co.uk

New Wireless Fire Alarm and Detection System Unveiled

A new wireless fire alarm and detection system has been unveiled by COOPER FIRE that will be available globally in early 2011. The new CW9000 uses a new secure wireless system, providing a complete fire detection without the need for a cabled connection between the field devices and the control panel.

According to Cooper, wireless technology offers unique advantages when compared with the installation of wired detection and alarm systems, including fast and simple installation, reduced cost, and reduced disruption and greater flexibility.

Based around established components, the panel, detectors, sounders, beacons and call points give the CW9000 range a highly reliable foundation into which the wireless technology has been integrated to provide a full-feature analogue addressable fire detection and alarm system. The system includes what is claimed to be the market's first wireless detector with an integrated sounder and beacon, reducing the need for multiple devices. The system also boasts the longest signal range in the market measuring up to two kilometres in free air, limiting the amount of booster devices required.

It is designed to conform fully with all aspects of the European standard EN54-25 (Fire detection and fire alarm systems).

For more information go to www.cooperfire.com



CON-SPACE USAR Camera Offers Greater Versatility

A new victim location camera has been launched by CON-SPACE COMMUNICATIONS. The new SearchCam 3000 is claimed to be a new concept in a urban search and rescue cameras; one that can be also be used for vehicle extrication, in shafts, underwater or for fire investigation.



The camera is powered by lithium ion battery sticks, which are interchangeable with the Delsar LifeDetector batteries. The Video Display Unit (VDU) is attached to a power module via a mechanical quick-disconnect and the coiled cable allows for the VDU to be held up to two meters away from the power module. The 240 degree articulating camera has built-in audio and provides rescuers with the ability to see and communicate with trapped victims. A clutch-equipped gear box protects the motor and the gears from damage during use.

The quick disconnect feature provides rescuers with imaging flexibility; a full-resolution colour camera with LED lighting, or black-and-white imaging with infrared lighting. The camera can be lowered into dusty, harsh and wet void spaces, providing teams with a clear well-lit view of the search area. With the environmental sleeve installed, the camera head can be submersed in water up to 23 meters deep, and interchangeable tube sets allow the extension of the camera to reach between 338cm and 566cm. Files from the SearchCam can be uploaded to a computer for playback, archive and search review purposes.

For more information go to www.con-space.com

The CBRN Threat

Assessment, consequences and the requirements for personal protection

Since the end of the Cold War a new global security situation has emerged. The dangerous but stable balance of power has developed into a complex and shifting pattern of instability on a regional and potentially global scale.

With regard to attacks with CBRN weapons, there is also a substantial change of paradigm. Large scale employment of CBRN weapons in classical military operations has become unlikely. However, their use by rogue states in regional conflicts may happen. So, an emerging challenge for the military and population is the offensive use of CBRN weapons by terrorists, aimed at achieving casualties and psychological impact.

Traditional CB agents, non-traditional agents, toxic industrial chemicals (TICs) and dirty bombs are all in the range of possibilities; even the use of nuclear devices cannot be ruled out. Like improvised explosive devices, chemical, biological and toxic agents can be deployed in unlikely places at unexpected times.

At the same time as this change in the CBRN threat, occupational safety and health expectations have been heightened, resulting in reduced acceptance of casualties.

Consequences

Individual protective equipment has to address a broader range of challenges, including non-traditional agents and toxic industrial chemicals. For skin protection, a reduction of physiological burden, enhanced robustness and durability, and increased liquid and aerosol protection are essential. A reasonable trade-off between protection and physiology has to be achieved, while for respiratory equipment, a further reduction of the breathing resistance and improvements in protection and ergonomics are necessary.

As CBRN attacks can take place without warning, protective garments have to be worn as a preventive measure; the anticipated wear time will be longer, whereas the period of exposure will be shorter. The consequence is that, alongside CBRN protection, greater functionality has to be integrated into the soldier's clothing system, such as ballistic protection, electronics, optronics, power supply and sensors. The general demand for life-cycle cost reduction will also have an impact on personal protection equipment.

Skin protection

This will require:

- Methods to quantify specific requirements, such as protection against TICs, aerosols and heat stress.
- Light, robust and flexible textiles for protective garments, with enhanced mechanical durability, protection against liquid agents, aerosols, TICs, flames, vectors and electrostatic effects by using new technologies such as nanotechnology.
- Light and flexible materials for protection against gross liquid contamination and radioactive particles.
- Reactive and catalytic systems for extended lifetime and safe disposal.



- Innovative adsorbents with higher specific capacity and/or broadband efficiency such as metal organic frameworks (MOFs).
- Efficient body cooling technologies and health monitoring systems for use in contaminated environments.
- Design improvements for enhanced protection and ergonomics and reduced physiological burden.
- Integration of the CBRN protection into the clothing system for maximum manoeuvrability, as well as compatibility with all components of personal equipment and protection against low temperatures and rain or wetness.
- Sensors for monitoring the remaining protective capacity of protective garments.
- Replacement of impermeable hand and foot protection by adsorbent components.

Respiratory protection

This will require:

- Considerable reduction of breathing resistance.
- Innovative impregnations for enhanced protection, lighter weight and less bulk.
- Ergonomic improvements, such as integration of respiratory protection into helmets and positive-pressure air supply systems.
- Sensors for monitoring the residual lifetime of filter canisters.

Safeguarding the future

The future cannot be predicted, the risks cannot be defined nor can how these risks can be countered or diminished. Deterrence and prevention are the first and preferred lines of defence, backed by a credible capability across the spectrum of operations and forces, including the ability to protect the soldiers and to operate in a CBRN environment.

APF

New Rotary Rescue Saw

The New CUTTERS EDGE Multi-cut CE807R B1 Series Rotary Rescue Saw offers a powerful new 80.7cc engine and a four-stage filtration system to assure outstanding performance in any cutting situation. According to Thomas Ruzich, Cutters Edge president: "The 807 really is a new generation rotary saw engineered with a specific gear reduction ratio to turn our vacuum-braised diamond blades at the optimum speed to cut anything you'll face in any rescue situation."

In addition to the new engine, the B1 SERIES includes an advanced, uniquely textured full-wrap handle that produces extreme anti-slip characteristics to provide dependable cutting performance, in any position. A new self-adjusting blade guard provides the operator with complete protection from the blade and any thrown debris during cutting, or it can be locked in place for a precise, controlled depth of cut.



Additional features Include:

- Digital electronic Ignition.
- Compression relief valve.
- Big Grip starter handle to ensure easy starts.
- A reversible cutting arm that provides improved access in limited space.
- The handles and fuel tank are isolated from the engine, reducing vibration and keeping fuel from overheating, eliminating vapour lock.
- The handles are fitted with six anti-vibration points to reduce vibration and maintain solid handling for precision cuts.

Cutters Edge Black Lightning and Black Star diamond blades

Cutters Edge high performance diamond cutting blades are specifically engineered for cutting any material found at: fires, rescues, building collapses, natural disasters, terrorist attacks and car, bus, train and plane accidents.

30% more diamond cutting surface exposed

An advanced vacuum braising process permanently fuses the cutting diamonds to the substrate of both blades revealing 30 percent more cutting surface for longer blade life and faster cutting.

The CE807R B1 Series comes standard with the Black Lightning Diamond Blade, the fastest cutting diamond blade available. This unique, in-line cooling port design enables high speed cutting and enhanced blade life – 100 times or more longer than standard rotary saw blades. The Black Star Diamond Blade is designed specifically for longer cutting life, up to 200 times or more longer than standard rotary saw blades.

Both cutting blades offer bi-directional cutting

capability, cutting safely in either rotational direction for longer blade life and maximum performance. Unlike other blades with angled gullets, The Black Lightning and Black Star's perpendicular gullet design enables cutting in both directions for longer blade life, enhanced safety and faster cutting.

Both diamond blades also fit all competitors' rotary saws and are available in 30.5cm, 36.6cm and 40.6cm sizes. The Black Lightning is also available in an 11.4cm size to fit angle grinders.

The MULTI-CUT CE807R B1 Series is also available in a field kit

The 11-piece field kit includes the CE807 R B1 saw with a 36.6cm Black Lightning blade and a water kit attachment.

In addition, the Kit also includes:

- 36.6cm Black Star Diamond blade (spare).
- 4.75 litre Fuel container.
- 236.5ml two-cycle synthetic oil mix – enough to make 30.28 litres of fuel mix.
- 1 – 1.9cm by 22.9m MYTI-FLO woven water hose.
- 1 – spare spark plug.
- 1 – spare drive belt.
- 1 – spare foam air filter.
- K&N filter recharger kit.
- Srench tool and Allen wrench.

All of the above is securely stored in a rugged lightweight, rustproof Diamond Plate aluminium case with advanced engineered hold-downs to secure the saw and accessories from movement during even the most extreme transportation situations.

APF



First Choice Of First Responders.

Cutters Edge Rescue Saws are designed and built to deliver 100% reliable, high performance cutting in the most demanding and extreme conditions encountered by Fire and Rescue Professionals.

SIZE MATTERS! New 2186 MULTI-CUT™ Rescue Saw

With more power than any other Fire Rescue chainsaw available and up to a 61cm bar and the D-10 Guard/Depth Gauge for safety, speed and ease of use. Equipped with the BULLET® Chain that cuts safer, faster and longer than any other carbide chain made.



Gas Powered Concrete Rescue Saw

Cuts reinforced concrete up to 41 cm thick in minutes with the GCP SealPro® Diamond Chain and powerful 101cc engine. It's fully portable, operates in any position and just one water hose needed for dust-free cutting in rescue situations.



The New Generation Rotary Saw is Here!

Rotary Rescue Saw

The CE807R Rotary Rescue Saw has a new, more powerful 80.7cc engine and a non-slip rubber Full-Wrap Handle for all position cutting. A new 4-Stage Air Filtration System, incorporating a High Performance K&N Filter as its third stage assures outstanding performance in all cutting conditions. Fully-equipped Sawing Kit is available plus Black Lightning and Black Star Diamond Cutting Blades.



Fully Equipped Sawing Kits are Available for All Three Models

Cutters Edge®
FIRE RESCUE SAWS

Tele: +1-(541) 524-9999 • Email: info@cuttersedge.com • www.cuttersedge.com



“The independent alternative”

Foam Concentrates and Foam Systems



fomtec
Fire Fighting Foams & Equipment

Dafo Fomtec AB P.O Box 683 SE-135 26 Tyresö Sweden
Phone: +46 8 506 405 66 Fax: +46 8 506 405 29
E-mail: info@fomtec.com Web: www.fomtec.com



Know Your Foams

By Ted H. Schaefer,^{1,2}
Bogdan Z.
Dlugogorski² and
Eric M. Kennedy²

¹Solberg Asia Pacific Pty
Ltd
3 Charles St., St Marys,
NSW 2760, Australia
Fax: (02) 9673 5303
Email:
ted@solbergfoams.com

²Process Safety and
Environment Protection
Research Group, School
of Engineering,
The University of
Newcastle,
Callaghan, NSW 2308,
Australia

With the current confusion surrounding firefighting foam technology, it is time to review what we know, and what is new; to bridge the information gap of the past eight years and understand where we are in 2010.

Over the past Century fire-fighting foams have evolved into several forms for Class B flammable liquids and Class A combustible solids applications that are still in use today. There are more than ten foam categories listed in Table 1 (see p16). They listed in the approximate chronological order of their acceptance into the fire-protection market. The following table shows the foam category, use and typical application equipment.

Before the 1960s, protein foam was the primary fire-fighting foam in use on flammable liquids. High expansion foam was used to fill up warehouses and has developed as a specialty fire-fighting technique for LNG and LPG hazards. Medium expansion foam also came into use and gained popularity for basement fires in Europe. Table 2 (see p16) shows a summary of fire-fighting foam technology and its chemistry.

Aqueous film forming foams have, since the mid 1960s, been used as one of the primary fire-fighting foam technologies for extinguishing flammable liquid fires. AFFF was the result of a joint research initiative between the US Naval Research Laboratories and an industrial partner. What was innovative about AFFF technology was its use

of fluorosurfactants, which gave the foam the characteristics of rapid movement on fuels, foam fluidity, self healing, and unrivalled fire mitigation performance. The subsequent formulations of AFFF contained mixtures of fluoro and hydro-carbon surfactants. The fluorosurfactants had characteristics of high temperature resistance, chemical inertness, and created a low surface tension at an air – solution interface. The hydro-carbon surfactants assisted with the generation of the foam structure.

Fluorinated surfactants have become one of the critical components of high performance film-forming fire-fighting foams, applied against fires of liquid fuels (Class B combustible). For this reason, all foams used on liquid-fuel fires came to be denoted as Class B foams, as opposed to Class A foams that are routinely employed for fighting fires of carbonaceous materials (Class A combustibles). This article will primarily focus on Class B foams.

A typical AFFF formulation contains a number of components including water, diethylene glycol mono butyl ether, alkyl sulphate surfactants (such as sodium octyl sulphate, sodium decyl sulphate, or sodium decyl ethoxy sulphate),

Table 1. Fire-fighting foams categories

Category	Foam Use	Application Equipment
Protein Foam	flammable liquids	low expansion nozzles
High Expansion Foam	combustible solids, flammable liquids, LNG, LPG	Hi-Ex foam generators
Medium Expansion Foam	combustible solids	medium expansion nozzles
AFFF	hydrocarbon liquids	low and medium expansion nozzles
AFFF-ARF ⁺	hydrocarbon and polar solvent liquids	low and medium expansion nozzles
Fluoro Protein	hydrocarbon liquids	low expansion nozzles
FFFP	hydrocarbon liquids	low expansion nozzles
FFFP-ARF ⁺	hydrocarbon and polar solvent liquids	low and medium expansion nozzles
HAZMAT Foams	special hazards	low expansion and special equipment
Class A	Class A combustible solids including wildland	low, medium, high expansion and CAFS
Fluorine Free	combustible solids and flammable liquids	low, medium, high expansion and CAFS
Fluorine Free-ARF ⁺	hydrocarbon and polar solvent liquids	low, medium, high expansion and CAFS

Note: + The current practice is the use of low expansion nozzles on polar solvent risks.

fluorosurfactants, and other additives. Some of the other additives can assist foam stability, pH control and corrosion protection. Table 3 (see p17) lists an example of an AFFF fire fighting foam formulation as found in literature.

Alkyl sulphate surfactants, sometimes called hydrocarbon surfactants, play a major role in an AFFF formulation and help generate stable foam. The diethylene glycol mono butyl ether and the urea also extend the life of the foam, which is sometimes measured as foam drainage time. Fluorochemical surfactants significantly decrease

the surface tension of foam solutions. Other surfactants can be used to manufacture AFFF products, including alkyl amido betaine, alkyl glucoside, alkyl coco amidoglycinate, alkyl acid β -amino dipropionate, ethoxylated t-octyl phenol, and others. Formulations can also contain polysaccharides such as xanthan gum.

The fundamental property that reflects the fire suppression performance of fluorosurfactant based foams is the spreading coefficient. The spreading coefficient is calculated from the surface tension of the foam solution at the air interface

Table 2. Summary of modern foam technology and its chemistry

Foam Technology	Major Components of Foam Chemistry
Protein Foam	Protein (hydrolysed)
High Expansion	Hydrocarbon surfactants
Medium Expansion	Hydrocarbon surfactants
AFFF	Fluorochemicals* + hydrocarbon surfactants
FPF	Fluorochemicals* + protein
AFFF-ARF	Fluorochemicals* + hydrocarbon surfactants + polymer***
FFFP	Fluorochemicals* + protein + hydrocarbon surfactants**
FFFP-ARF	Fluorochemicals* + protein + hydrocarbon surfactants** + polymer***
HAZMAT Foams	Fluorochemicals* + hydrocarbon surfactants + polymer*** + neutralizers
Class A Foam	Hydrocarbon surfactants
Fluorine Free	Hydrocarbon surfactants + polymer**** (optional)
Fluorine Free -ARF	Hydrocarbon surfactants + polymer****

Note:

* Fluorochemicals including fluorosurfactants, fluoropolymers, and fluorinated co-polymers.

**Hydrocarbon surfactants are likely present to support aqueous film formation.

*** Polymers are most likely polysaccharide polymers, but could be substituted with fluorinated polymers to reduce viscosity.

**** Polymers are polysaccharide polymers.

Table 3. Typical PFOS based 6% AFFF fire-fighting foam concentrate formulation.

Raw Material	Weight %	Function
Water	78-81	Solvent
Diethylene glycol mono butyl ether	10	Solvent, foam stabilizer
Alkyl sulphate surfactants – Sodium octyl sulphate – Sodium decyl sulphate – Sodium decyl ethoxy sulphate	1-5	Foaming
Fluorosurfactants	0.9-3	Foaming, film formation, surface tension control
Triethanolamine	0.1-1.0	Foam stabilisation, pH
Urea	3-7	Foam stabilization

(σ_a), the interfacial tension (σ_i) between the foam solution and a selected fuel, and the surface tension of the same fuel (σ_f). The spreading coefficient is expressed in Equation 1.

$$S_{aff} = \sigma_f - (\sigma_a + \sigma_i) \quad (\text{Equation 1})$$

Fluorosurfactants are capable of the low surface tension required to produce a positive spreading coefficient, a behaviour hydrocarbon surfactants find unachievable on their own. AFFF, FFFP, AFFF-ARF, and FFFP-ARF fire fighting foams all contain a blend of fluorosurfactants and hydrocarbon surfactants, and in addition the protein based foams contain hydrolysed protein. Laboratory investigations show that a 6% AFFF foam concentrate solution can achieve a surface tension of 16 to 18 mN m⁻² at the surface-air interface, as compared with 70 mN m⁻² for deionised water. A hydrocarbon surfactant mixture can achieve a surface-air interface surface tension of only 24 to 35 mN m⁻².

In a three-phase air-water-hydrocarbon system that exists at the base of a fire of a hydrocarbon liquid mitigated with aqueous foam, a fluorinated surfactant positions itself at the foam solution-air interface, with the head group in the aqueous solution and the perfluorocarbon chain “sticking up” in the air, as shown in Figure 1. The chemical chain can be simultaneously water repellent (that is, hydrophobic) and have no attraction for fat (that is, lipophobic). No other common surfactants exhibit this property. This can lead to the formation and spreading of thin aqueous foam-solution films on surfaces of hydrocarbon liquids. Such

films limit the evaporation of fuel by imposing a barrier to mass transfer and decrease the heat flux from the flame to the fuel.

The fluorosurfactants display a unique structure that involves a combination of perfluorinated and hydrocarbon segments. The result is a surface active agent that has a water soluble end (hydrophilic) and a perfluorinated end that has a non-water soluble (hydrophobic) end. In addition to repelling water, the hydrophobic part of the fluorinated surfactant also repels hydrocarbon liquids and oils; that is, it possesses the lipophobic properties. In effect, the perfluorinated end positions itself in the air phase within a three-phase air-water-oil system.

As a consequence of the improvement that the fluorosurfactants made for the extinguishment of flammable liquid fires (Class B), changes were introduced to protein based foams to create fluoroprotein foams (FPF). New foams were developed through the 1970s, which included AFFF – alcohol resistant foams (AFFF-ARF), film forming fluoroprotein foams (FFFP) and their alcohol resistant version (FFFP-AR) which commonly contain polymers of complex sugar. As a result, all Class B foams contained fluorosurfactants. Table 1 summarises the modern Class B foam technologies and their base chemistry. The fluorinated surfactants, or surface active agents, include traditional fluorosurfactants (C_nF_{n+1}-R) and also fluoropolymers, (fluoropolymer surface active molecules which appeared in literature between 2001 and 2009) and fluorinated co-polymers which are now found in almost all modern fluorochemical containing Class B foams. Specific fluoropolymers may also substitute polymers of complex sugars in low

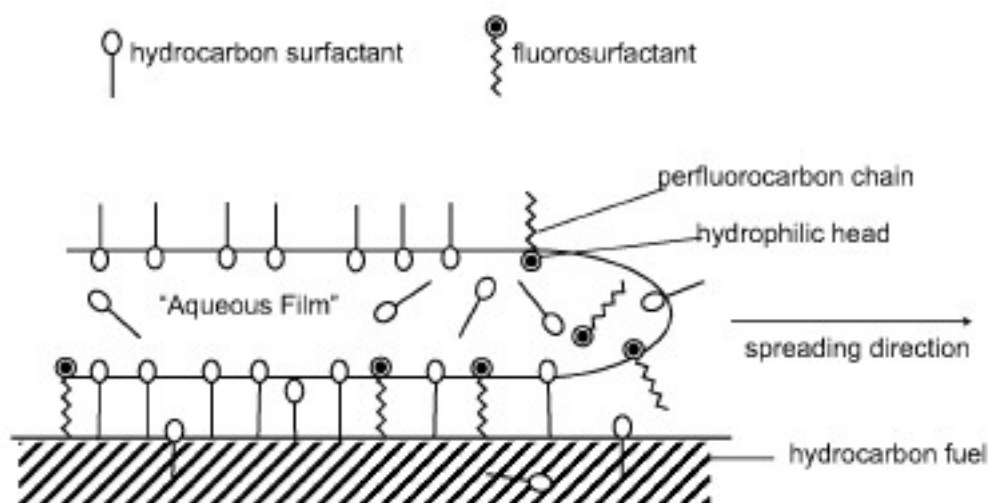
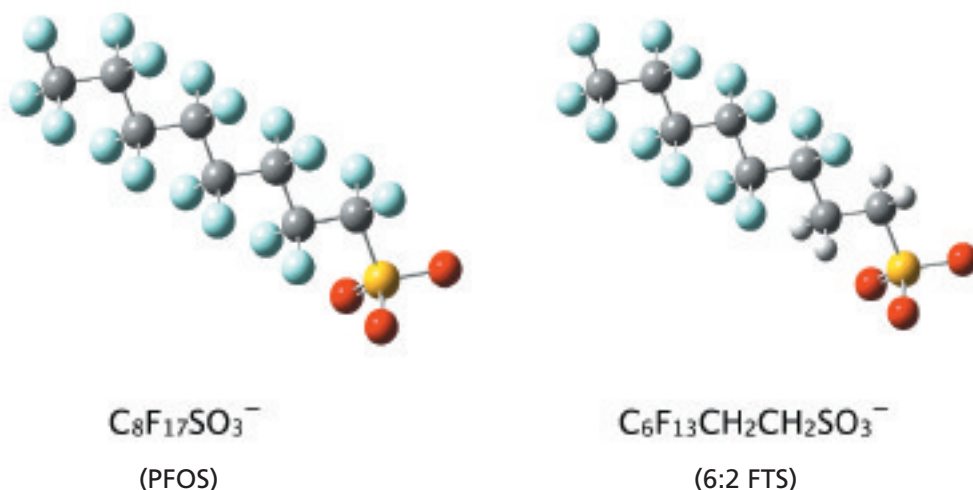


Figure 1. Schematic diagram of a thin film spreading on a hydrocarbon surface. The size of the surfactant molecules, which is miniscule in comparison to the thickness of the thin film, has been greatly exaggerated. The hydrocarbon surfactants are shown at a higher concentration, with some having the fate of moving into the hydrocarbon fuel. The fluorosurfactants are shown at a lower concentration, resisting movement into the hydrocarbon fuel

Figure 2. Structures of two fluorosurfactants, a simple PFOS ($C_8F_{17}SO_3^-$) and 6:2 fluorotelomer ($C_6F_{13}CH_2CH_2SO_3^-$), positioned for direct comparison of molecular geometry of both anionic species.



viscosity formulations. Most of these formulations will also contain a glycol based solvent to aid solubility and performance.

Chemical companies that manufactured fluorosurfactants based on perfluorinated telomers groups. Currently, the most common fluorosurfactant used in Class B fire fighting foams results from the telomer process with the following formula, $C_6F_{13}CH_2CH_2SO_3^- NH_4^+$. All fire-fighting foam manufacturers have been relying on a small group of specialized chemical companies for sourcing their fluorochemicals. More recently, water soluble/dispersable fluoropolymers are being added to modern fluorochemical containing foams. Recently developed fluoropolymers are highly surface active, and are therefore surfactants, and can work with 6:2 FTS based surfactants. These molecules can also be described a polyfluorinated, yet they still contain a perfluorinated $-C_6F_{13}$ end group.

It is the perfluorinated portion of the surfactant molecule that equips fluorosurfactants and their polymers with their unique surface chemistry characteristics, including chemical inertness and heat resistance. The heat resistance of the fluorinated portion of the molecule was considered a desirable property for a harsh environment such as fire. The organic portions appear to biodegrade quite rapidly, leaving the perfluorinated segment of the chain as inert and non-biodegradable. Such perfluorinated segments do not occur naturally in the environment. They do not decay further by photolytic, hydrolytic or biological means, and tend to be highly persistent in the environment, with implications of potential bioaccumulation.

Fluorosurfactants are capable of reducing the surface tension of water from 70 mNm^{-2} to about 16 mNm^{-2} . This characteristic allows the formation of a thin aqueous film on top of most hydrocarbon solvents. The thin film promotes the spreading of foam and suppression of hydrocarbon solvent vapour. The fluorinated end of these surfactant molecules are chemically inert, which enhances the heat resistance of films at the fire front and reduces solvent solubilisation in the foam. The inert properties of the fluorinated chain prevent the surfactant molecules from complete degradation if dispersed in the environment. A study has revealed the presence of several types of organic fluorides, including a carboxylated species, later identified as PFOA.

Klein has put forth an argument that the structural differences between a simple PFOS molecule such as $C_8F_{17}SO_3K$, and 6:2 fluorotelomer ($C_6F_{13}CH_2CH_2SO_3^- NH_4^+$) are marginal. They have a similar length and the ends of the molecules are identical in diameter. Therefore, in biological systems that function on key-lock mechanisms due to molecular geometry, the aforementioned structures could have similar acceptance at an active site. Figure 2 illustrates the structure of the simple PFOS and the 6:2 fluorotelomer. To date, no research have been established to prove or disprove this hypothesis. Though, a recent report have confirmed the associations of PFOA with the manufacture of 6:2 fluorotelomer and manufacturers' pledge to reduce the sources.

At the time of writing this article it has become apparent that a fluorochemical manufacturer is deleting some of its product range used in fire-fighting foams to meet the US EPA 2010/2015 PFOA Stewardship Program. Constant vigilance is required to stay informed of the regulatory changes and new developments from manufacturers. The change over to pure 6:2 FTS is also complicated by performance issues. The burn back resistance of pure 6:2 FTS fluorotelomer is not as good as previous versions of 6:2 FTS.

The greatest challenge faced by the manufacturers of fire-fighting foams is to design a foam concentrate that has the required fire performance without using fluorochemicals. The approach of Dlugogorski et al. [2002] was to identify the properties of fire-fighting foams containing only hydrocarbon surfactants that were required to achieve the extinguishment performance equivalent to that of AFFF, FFFP and FPF formulations.

Dlugogorski et al. [2002] linked these properties with the fundamental behaviour of surfactant solutions and foams, such as surface tension, surface viscosity, foam drainage, foam coarsening, foam bulk viscosity, and foam yield stress. They argued that it should be possible to develop non-fluorochemical fire suppression technology by adjusting the surface properties of surfactant solutions and by generating foams characterised by polydispersed bubble sizes. Foams composed of bubbles of several sizes possess lower yield stress and lower bulk viscosity and are better able to flow faster over surfaces of liquid fuels than foams composed of uniformly sized bubbles.



AFFF Foams . . .



**So everyone
will make it home
safely tonight.**

Today's advanced AFFF agents:

- Are most effective to fight flammable liquid fires.
- Provide the best extinguishment and burnback performance.
- Have minimal environmental impact.
- Have a low toxicity and biopersistence profile.
- Are approved by global regulatory agencies.

Table 5. Results from ICAO level B fire tests (4.5 m² pan).

	ICAO Level B specification	FFreeF #1 (high performance)	AFFF #1	AFFF #2 (mil spec)	AFFF #3 (mil spec)
Fluorochemical technology		No	Yes	Yes	Yes
Solution strength	3 or 6%	6%	6%	6%	3%
90% control	–	30 s	–	38 s	26 s
Extinguishment	< 60 s	46 s	50 s	46 s	44 s
Burn back time	> 5 min	> 8 min [#]	7.1 min	> 8 min [#]	> 8 min [#]

Note: # No indication of re-ignition or burn back of foam was observed after 8 min on any of the tests.

To successfully eliminate film forming chemicals and obtain the required performance, it would be necessary to act like the aqueous film with layers of bubble walls. A bubble wall is a thin aqueous film in itself. Therefore many bubble layers would give a performance not unlike an aqueous film of AFFF, provided that the foam layer could move with sufficient velocity. A foam consisting of polydispersed bubble sizes would work on the principle of forming a fast flowing, low yield stress foam structure that would have a significantly longer drain time than an AFFF.

High performance fluorine free foams work on the principle of forming a flowing low-yield-stress foam structure that has a significantly longer drain time than an AFFF. The generated foam moves freely and quickly, and it has good heat resistance that allows fast fire securement. If the foam structure is broken, the bubbles flow back to fill the

coming under severe scrutiny by environmental agencies. This may result in further regulations and restrictions on the use of fire fighting foams containing fluorochemicals.

Fluorine free foam (FFreeF) technology has improved dramatically with the introduction of high performance products and now challenges traditional fluorochemical containing technology. The research associated with this article illustrates the overlap in the performance of AFFF and high performance FFreeF technology. The essential properties of any new Class B foam technology, which omits fluorochemicals, include slow drainage, high heat resistance, slow coarsening, low shear viscosity and low yield stress. Foams that have these essential properties are representing a new fire-fighting foam technology that provide a responsible environmental profile. However, not all FFreeF foam products meet high levels of fire

Fluorine free foam (FFreeF) technology has improved dramatically with the introduction of high performance products and now challenges traditional fluorochemical containing technology. The research associated with this article illustrates the overlap in the performance of AFFF and high performance FFreeF technology.

missing foam structure such that the foam is capable of repairing punctures and structural damage, i.e., self-heal. The foam has been observed during burn back tests to move toward an open ignited fuel surface, reducing the area of the fire and sometimes extinguishing it completely. The performance of this type of agent is reliant on the existence of functional layers of bubbles. Table 5 lists test results for the FFreeF foam as witnessed by Det Norske Veritas, and also includes the test results of three AFFF products containing different fluorochemical technologies.

The experimental results showed that the four foams tested had similar performance, whether they contained fluorochemicals or if it was the high performance fluorine free product FFreeF #1.

Conclusions

Fire-fighting foams have a diverse chemistry to handle Class A and Class B risks. The primary Class B foams of today contain environmentally persistent fluorochemicals. Owing to the environmental persistence of fluorochemical degradation products, the use of fluorochemicals in dispersive applications, such as in fire-fighting foams, is

performance. The technology has passed the ICAO level B fire performance criterion, meeting the performance of traditional AFFF and FFPF products. This new technology is the first fluorochemical free foam to meet this level of fire performance and it sets the benchmark for the future. **APF**

Acknowledgements

Some of the above information was previously published in the following papers as interim or incomplete releases of findings at conferences. There have been no intentional omissions of previous publication or copyright.

Dlugogorski B.Z., Kennedy E.M., Schaefer T.H. and Vitali J.A. (2002). "What properties matter in fire-fighting foams?". *Proc 2nd NRIFD Symp*, Tokyo, Japan, 57-78.

Schaefer T.H. (2002). "Class B foams...is it time to innovate?". *Proc AFAC Conf* (CD Abstracts), Gold Coast, Australia, 48.

Schaefer T.H., Dlugogorski B.Z. and Kennedy E.M. (2004). "Class B fire fighting foams – performance balanced with environment", *Fire Safety at Sea*, Melbourne, Australia (March 2004), CD-ROM, 1-18.

References available upon request

Dynax Makes it Simple:

+ C6 Fluorosurfactants + C6 Foam Stabilizers

= BEST AR-AFFFs and AR-FFFPs for Foam Agent Producers.

You can see how it all adds up:

Dynax C6 Fluorosurfactants and C6 Foam Stabilizers . . .

- Are all non-flammable
- All have low toxicity
- None are derived from PFOA nor do they degrade into PFOA
- All meet US EPA's 2010/15 PFOA Stewardship Program requirements

. . . And they make it possible to formulate 3x6, 3x3, 1x3, and 1x1 AR-AFFF and AR-FFFP agents that:

- Provide superior performance on hydrocarbon and polar fuel fires
- Meet UL 162 and EN 1568 standards
- May not require polysaccharide gums
- Have very low viscosity

Dynax Product	Ionic Type	Agent Application Guide			
		AFFF	AR-AFFF	FFFP	AR-FFFP
Fluorosurfactants					
DX1030	Anionic	●	●	—	—
DX1040	Anionic	●	●	—	—
DX1080	Nonionic	●	●	●	●
DX1090	Nonionic	●	●	●	●
DX1025*	Anionic	●	●	—	—
DX1026*	Anionic	●	●	●	●
Foam Stabilizers					
DX5022	Anionic	—	●	—	●
DX5065**	Anionic	—	●	—	—
DX5066**	Anionic	—	●	—	●

* Blend of Fluorosurfactants

** Blend of Fluorosurfactants and Foam Stabilizers

US EPA PFOA Stewardship Program

By 2010: 95% Reduction of facility emissions and product content level of PFOA, precursor chemicals that can break down to PFOA and related higher homolog chemicals.

By 2015: Elimination of PFOA, PFOA precursors and related higher homologue chemicals from emission and products.

DYNAX CORPORATION

PO Box 285, Pound Ridge, NY 10576 USA

T 914 764 0202 techinfo@dynaxcorp.com

F 914 764 0553 www.dynaxcorp.com

dynax
FLUOROCHEMICALS

STINGER[®] + WIRELESS ELECTRONIC TECHNOLOGY

STINGER RF... YOUR BEST LINE OF DEFENSE

New Stinger RF delivers big water in hazmat and other tough situations where you can't take a vehicle and won't send a firefighter. Stinger RF goes from truck mount to portable in seconds, and you can control it from 1/4 mile away with a hand-held or panel-mount remote. Get in. Get out. Play it safe. Let's talk. Call 1-800-346-0250.



Elkhart Brass
Fire Fighting Equipment

The Most Experienced Manufacturer of Fire Fighting Equipment

Elkhart Brass Mfg. Co., Inc. | 1-574-295-8330 | 1-800-346-0250 | www.elkhartbrass.com



Against The Elements

– CFA's Wildfire Firefighter Training



By Alison Aphys

Victoria CFA

While CFA members attend around 35,000 incidents each year, the first qualification they need in order to become operational is wildfire training. For many firefighters, wildfires will make up the majority of the incidents they attend. No matter their level of experience, members undergo regular refresher training to bring them up-to-date with using new equipment, techniques and processes. The training spans different levels from Minimum Skills right through to the expertise required to become a strike team leader.

It is a clear, cold spring evening and at fire stations all around Victoria, firefighters are gathered outside by their tankers preparing to practise drafting, hose-laying, pumping, firefighting and survival techniques. Despite summer being just around the corner, a cold southerly is blowing. In anticipation of a soaking, most are wearing a warm jumper under their yellow wildfire gear. Some members are decked out in brand-new gear, whereas a little wear and tear on others proclaims that this is not their first fire season.

Inside the station, another group of members is watching a video and discussing attack techniques depending on various topographies and weather conditions. More experienced members pass on sage advice to new recruits who listen soberly. Another group is outside perfecting their 'step-up technique' with the rake hoe, where firefighters use dirt to blackout rather than water. After they pack the equipment away and have a cuppa there is time for a joke and a catch-up. Everyone understands that effective training and planning can mean the difference between success and tragedy.

While learning how to fight fires is an integral part of training, CFA insists that firefighter safety is its number-one priority. "The safety of our people is of the highest importance to CFA," states Greg Baxendale, Manager Training & Development, Districts 4 & 5, Barwon South West Region. "CFA's Safety First culture is embedded in the organisation."

Greg explains that this means new volunteer firefighters need to undertake the right training before qualifying with Minimum Skills and being

New recruits come from all backgrounds – school teachers, plumbers, retirees, shopkeepers, university students, nurses, stay-at-home parents, accountants, mechanics and farmers to name just a few. But they are all united by a desire to help their communities.

No matter if they are a new recruit or a veteran of Ash Wednesday or the 2009 Victorian Fires, everyone takes their training very seriously. They come from all backgrounds – school teachers, plumbers, retirees, shopkeepers, university students, nurses, stay-at-home parents, accountants, mechanics and farmers to name just a few. But they are all united by a desire to help their communities. They give up anything from a few hours a week to attend training and call-outs to using up their annual leave to join a strike team when needed.

So there is no mucking around as they go through their training, which includes bowling and connecting hoses to couplings, operating pumps and applying water from a variety of branches.

able to attend fires. He says that once this basic training has been completed there are dozens of advanced courses on offer.

Plus, CFA's more experienced members may also choose to undertake regular refreshers to ensure they are conversant with new equipment and processes. "Wildfire training involves more than 'squirting the wet stuff on the red stuff'," Greg says. "Members may also need to update their qualification or master other skills in such diverse areas as drafting, truck driving, first-aid, crew leading and management, fire investigation, communications and mapping. They are also able to progress into very specialised Incident Management roles with the appropriate experience."

Greg stresses that members need to be prepared

TRAINING

Henry Barton, centre



to continue their learning throughout their CFA membership. "Let us not forget that education of any sort is simply the foundation of a person's life-long learning, it is not the end of it," he says. "For example, when volunteers are first qualified in a

particular competency, their proficiency level is adequate to be deemed competent. It is only through practice, that volunteers truly become proficient and are then able to operate at the level that the community expects them to operate at."

The International
FIRE & EMERGENCY
TRAINING LEADER




TRAIN ■ SERVE ■ RESPOND

TEEX trains emergency response personnel from more than 45 countries each year. Each course can be tailored to meet your exact needs in a variety of areas.

- Municipal / Industrial Firefighting
- Industrial Emergency Response Specialist
- Hazardous Materials Response
- Search & Rescue / USAR
- Aircraft Rescue & Firefighting
- Fire & EMS Leadership
- Fire Officer / Instructor
- Marine - Shipboard Firefighting
- Oil Spill Response
- Emergency Medical Service
- Emergency Management / NIMS
- Incident Command
- LNG Emergency Response
- Assessment / Technical Assistance

Schedule these or any of our 130+ courses today.
www.teex.org/fire • 1.866.878.8900

TEEX TEXAS ENGINEERING EXTENSION SERVICE
 A Member of The Texas A&M University System
 201 Tower • College Station, TX 77843-7698



Greg says that by offering high-quality training and education to CFA members, its firefighters and support people have the opportunity to do their best when the situation demands.

Warrnambool Fire Brigade (WFB) Operations Officer Henry Barton says ongoing wildfire training helps the brigade's 35 career and volunteer firefighters gain confidence in their own skills as well as those of their colleagues. He says the career firefighters enjoy the time they dedicate from October to December providing wildfire skills maintenance with the volunteers. The training is conducted over four nights and often involves volunteers from neighbouring brigades.

"This training is a good opportunity for our members to not only refresh their training but to also interact with each other in action and gain confidence in the abilities of their colleagues," he says. Henry says that the WFB has been providing the training for around a decade. "The confidence that volunteers and staff gain in each others' capabilities is excellent," he says.

Victoria CFA has more than 59,000 volunteer members plus over 550 career firefighters and is responsible for protecting approximately 3.3 million people and 1 million dwellings.

Henry says that all brigades in District 5 are participating in wildfire training as a part of their Section 29 compliance, which reviews brigade viability and ability, from people through to the processes and equipment. "This means that when members go on a strike team or attend an incident with their colleagues from other District 5 brigades, they know that everyone has undertaken wildfire skills maintenance and they can have confidence in their fellow members," he says.

Based in Hamilton in Victoria's south-west, CFA Senior Wildfire Instructor Bill Speirs and his colleagues endeavour to create, run and deliver exceptional firefighter education and training. A highly experienced fire investigator and firefighter, Bill joined CFA as a volunteer in 1962 and is currently a member of the Nelson Fire Brigade, situated on the rugged Victorian coast near the South Australian border.

According to Bill, all members, career or volunteer, receive comprehensive training. "We teach our members right through from Minimum Skills to fireground leadership roles," he says. "This includes crew leader, strike team leader and sector commander courses and the incident management roles including planning and logistics."

Bill explains that one of the biggest training challenges is that the volunteers undertaking these courses are doing so on top of their work, family and community commitments. "We aim to make



Bill Speirs

Dr. STHAMER HAMBURG

FOAM FIGHTS FIRE

1886 - 2011
125 Years
worldwide

We offer a full range of Internationally Approved, High Performance, Environmentally Compatible Fire Fighting Foams.

24/7 EMERGENCY SUPPLIES PLEASE CALL +49 40 7361680

Dr. Sthamer Hamburg
Liebigstrasse 5 · 22113 Hamburg · Germany
Phone +49 40 736168-0, Fax +49 40 736168-60
E-mail: info@sthamer.com

www.sthamer.com

TRAINING

the training interesting, relevant and enjoyable because if we do not hold their attention after their day's work, we have lost them," he says. "We strive to have participants involved rather than sitting through a lecture process."

Flexibility is also a key strategy so courses are usually run outside office hours and scheduled to suit particular groups. "Some volunteers are happy to give a weekend or specific night so we work around this," he says. "With dairy farmers we might run shorter day courses so they can fit in their milking."

**We aim to make the training
interesting, relevant and
enjoyable because if we do
not hold their attention
after their day's work, we
have lost them.**

Bill says that it is important to balance out the classroom learning with the practical. "We interperse the theory with hands-on scenarios so we select locations that reflect the topography and weather conditions of the topic and this seems to work really well," he says.

One firefighter who has attended Bill's wildfire



Katrina Knowles

training is volunteer Katrina Knowles of the Mill-town Fire Brigade. Like her colleagues, she is keen to keep her skills up-to-date so that when she dons her turnout gear she is fully prepared. Although Katrina joined CFA in 2007, she has rapidly undertaken a number of training courses including crew leader.

"I think that the CFA training is very professional, the facilitators make the effort to know and understand everyone's background and skills so their training can be delivered in such a way that





Re-Healing™ Foam RF6

Class B Flammable Liquid Class A Combustible Solids

NO FLUOROSURFACTANTS NO FLUOROPOLYMERS NO FLUOROTELOMERS

Proven Solberg Foam Technology – always reliable in a crisis



New Technology, Traditional Performance

RF6 can be applied with all existing equipment. When proportioned at 6% concentration with water of all kinds it has the ability to flow quickly and freely across the surface of hydrocarbon flammable liquid fuel. Fire control and extinguishment is rapid and effective.

24/7 EMERGENCY STOCK 1800 802 902

Solberg Asia Pacific Pty Ltd, 3 Charles St, St Marys, NSW 2760
Telephone (612) 9673 5300 Fax (612) 9673 5303 www.solbergfoams.com





Boyd Falconer

Alison Aprhys is a freelance journalist who has worked in-house at CFA and is a volunteer firefighter.

For more information go to www.cfa.vic.gov.au

everyone benefits," she says. In regards to preparing for bushfires, Katrina adds that participating in Department of Sustainability and Environment (DSE) back-burning has also been very valuable. "When DSE did the burn-offs our brigade assisted and that was really good practice," she says.

Over at Gorae West Rural Fire Brigade (GWRFB), Lieutenant Boyd Falconer, a 17-year member, reckons you can always learn something new. A qualified crew leader and strike team leader, Boyd believes intense training is essential. "This provides us with the opportunity to hone our skills, reacquaint ourselves and other less active members with equipment and procedures and along with the various community fire ready programs provides us with an opportunity for the recruitment of new members."

We are quite often the only brigades on scene; we have similar types of areas and attend very similar types of incidents.

He says that during 2010 GWRFB has expanded its current combined district, group and brigade training to incorporate special sessions with two neighbouring brigades with which they often turn out. "This gives us the opportunity for more attendees, greater communication levels and better understanding of each others' crews and equipment as we frequently turn out to small incidents together," he says. "We are quite often the only brigades on scene; we have similar types of areas and attend very similar types of incidents."

Although he is now assisting newer members with training, Boyd says that over the years he has found that the support, variety, opportunity and the encouraging atmosphere that accompanies CFA training are some of main reasons he continues. "The opportunity to put into practice new skills learnt with the support and encouragement of a senior CFA member is something I find to be a very positive aspect of the training system," he says.

APF

FIGHT FIRE WITH FIRE

Simulation provide customised hot fire training simulators (static and transportable), designed to meet the needs of many different sectors including:

Civil Airports	Maritime	Local Authority	Military
Industrial	Training Schools	Offshore Oil & Gas	Mobile

Our highly personal approach has seen us become a simulator supplier for so many organisations, to find out how we can help you contact us on: +44 (0)1283 213395 or email info@simulation.uk.com

www.simulation.uk.com

Simulation

CON-SPACE

COMMUNICATIONS

TECHNICAL SEARCH



SEARCHCAM®
3000

- Waterproof camera head, submersible to a depth of 75 feet (23m)
- Clutch equipped gearbox, 240° articulating camera
- Adaptable modular design



- Locate live victims in collapsed structures
- Rugged, portable & easy to deploy
- Used by Search & Rescue teams around the world

CON-SPACE

hardline

- Portable, self powered, intrinsically safe
- Secure, uninterrupted communication
- Confined space, collapse, trench, high angle, mine



WATCH THE VIDEOS ONLINE.
www.con-space.com

THE ORIGINALS in Rescue Equipment

Rescue equipment

The power of innovation

Holmatro develops rescue tools based on the latest technologies, which make your procedures quicker, safer and easier.

www.holmatro.com

holmatro
mastering power

Holmatro Rescue Equipment BV | The Netherlands
T +31 (0)162-589200 | E rescue@holmatro.com



Christchurch Earthquake

– A Lesson In USAR



By Graham Collins

The 7.1Mw earthquake that struck New Zealand's South Island on 3rd September was larger than the earthquake that devastated the Caribbean Island of Haiti earlier in the year, killing 230 people, destroying 250,000 homes and 30,000 commercial buildings.

Earthquakes are a regular occurrence in New Zealand; the country forms part of the so called Pacific Ring of Fire, which is geologically very active. Most of the country's 14,000 or so earthquakes that are recorded each year are minor events; around 200 are strong enough to be felt. Inevitably, this has had an impact on the culture of the country in terms of the general awareness of earthquakes, disaster planning and building regulations.

The epicentre of the South Island earthquake was 55 kilometres north-west of the 386,000 population city of Christchurch – New Zealand's second largest city – in the Canterbury region. Almost two-thirds of the city's 160,000 homes were damaged, with an estimated cost of repairs running into NZ\$2 billion. Miraculously, nobody was killed; one man was hit by a falling chimney, while another was badly cut by glass. Ten people were admitted to hospital with suspected heart attacks triggered by shock.

Comparing this with the devastating impact of the Haiti earthquake must raise important questions about the methods used to construct buildings in earthquake-prone zones, city infrastructures and communications, emergency preparedness, and

USAR (Urban Search & Rescue) resources and training.

Almost 2,900 aftershocks of a magnitude 2Mw or more on the Richter Scale have been recorded since the original earthquake on 3rd September, including three of 5.4Mw magnitude. On 8th September, there was a large 5.1Mw aftershock with an epicentre just seven kilometres from the city centre and, on 19th October, there was a magnitude 5.0Mw aftershock that caused surface shaking that was reported to be the worst since the original earthquake. Some of these aftershocks have caused further damage to buildings in Christchurch's central business district, and have been felt as far away as Dunedin in the south-east corner of South Island.

Fast response

The Fire Service's response to the 3rd September earthquake was swift and decisive.

Immediately after the earthquake struck, the operation in Canterbury swung into place using its usual CIMS (Coordinated Incident Management System) structure. The Christchurch hazmat-command unit was based at what was designated



Emergency I Centre, in the Christchurch City Art Gallery, while the hazmat-command unit at Timaru; 160 kilometres south of Christchurch, was relocated to the USAR base at Woolston, three kilometres southeast of Christchurch city centre. Fire Service personnel were also sent to Emergency Operations Centres in Waimakariri, north of Christchurch, and Selwyn, a predominantly rural area in central Canterbury, to provide liaison and support. An IT specialist was added to the Environment Canterbury (ECan) Operations Centre.

USAR personnel from outside Christchurch were flown in within hours, and a full complement was on the ground in just over 48 hours. At national level, within hours operational and data and spatial intelligence personnel were providing support and information to the National Crisis Management Centre. Relief Executive Officers were deployed to support the regional command on 6th September, and the national headquarters' Quake Support Centre was set up to help with the deployment of relief personnel and provide welfare assistance. An Incident Management Team for welfare and support was also established in Christchurch and career and volunteer firefighters were deployed from around the country as an additional resource to local crews.

The operation moved quickly from response to recovery and it was almost business-as-usual within a fortnight.

USAR deployment

All three USAR taskforces – from the city of Auckland, the town of Palmerston North and Christchurch – were deployed immediately following the earthquake. These taskforces are made up largely of Fire Service personnel, along with support staff, paramedics, search dogs and handlers, and specialist building engineers. They are supported by the USAR National Management Team that was also mobilised to Christchurch. Their deployment and operational needs were also supported by the National Crisis Management Centre. The 130 or so personnel located themselves at the USAR base next to the Woolston fire station and training centre.

In the first four days, the USAR teams assessed every building in the central city area and well over 750 private homes. In the central city area the

USAR teams knocked out windows, secured walls, knocked down small unstable areas and taped off the dangerous buildings. As the days progressed, they began helping with the demolition of some of the large, unstable buildings and protecting others from being damaged by buildings with the potential to collapse from aftershocks.

Out in the suburbs and in the small towns in the Canterbury region, USAR teams demolishes a number of chimneys and advised residents about rooms that should not be used, the need to leave suspect structures, and when it was safe to stay.

Logistically it was, and is, the biggest event the Fire Service has responded to in 20 years. Personnel from across New Zealand provided support either on the ground or in support roles. In the first four days, crews officially responded to over 1,100 incidents although, in reality, the unofficial number was much higher. Several of the smaller brigades co-opted in for the emergency dealt with more incidents in a few days than they would normally deal with in a year.

More than 40 appliances were put to work in Canterbury during the emergency. In future, they will each come with an ALPS (Automated Location and Positioning System) GPS (Global Positioning System) locator, so dispatchers will be able to see at a glance where they all are and direct the nearest appliance to the next emergency.

Maps and data

The Data and Spatial Intelligence (DSI) team helped plug the information gap opened up by the earthquake. Staff worked out of the National Crisis Management Centre (NCMC), providing support for the Ministry of Civil Defence and Emergency Management and the New Zealand Fire Service national headquarters. They were also deployed in the Emergency Operations Centre (EOC) in Christchurch.

For the first few days, the Fire Service provided ICAD incident reporting and emergency services operational data to the National Crisis Management Centre, so they could see what incidents the fire, police and ambulance services were responding to, which helped the civil defence response. Within the first four hours, Canterbury region incident maps were delivered to the NCMC. By Tuesday, immediate tasking satellite imagery was delivered to the New Zealand Defence Force, and New Zealand aerial photography was in the hands of the Canterbury EOCs, along with radar data that showed terrain displacement. By Wednesday, in support of the Ministry of Civil Defence and Emergency Management (MCDEM) and the EOCs, data sharing and standardisation of building assessment data had been set up between the three different councils and regional council. This allowed all responding agencies to see a common operating picture.

By drawing on all the data available, the different agencies were able to help each other out and provide the Ministry of Civil Defence and Emergency Management with a comprehensive picture of what was happening. It also provided agencies with easy access to each other's information. For instance, SMS data could be searched to find information that the council did not have on key holders. ICAD and SMART maps could be used to find the names of buildings and/or addresses when building assessment sheets were returned from the field with only a business name for identification.

APF

> REMOTE AREA LIGHTING SYSTEMS

8 UNIQUE LED MODELS: PORTABLE + RECHARGEABLE + BATTERY POWERED

> SAFETY FLASHLIGHTS

OVER 22 MODELS: WATERPROOF + LED + RECOIL LED TECHNOLOGY*

> PROTECTOR CASES

OVER 60 SIZES : WATERTIGHT + DUSTPROOF

> HEADLAMPS

LED AND XENON MODELS PROVIDE BRIGHT LIGHT AND LONG LIFE

New from Pelican 9440 RALS

- 1200 Lumens (low), 2400 Lumens (high)
- 6 Hour (low), 3 Hour (high) Burntime
- Rechargeable NiMH Battery
- 2.19 Metres High (deployed)
- 120° Beam Spread



At the Intersection of Rescue and TECHNOLOGY

With Pelican's complete Fire and Rescue product range you can be certain every member of your team has the latest gear they need for the job.

From lighting systems to EMS cases, Pelican brings you the most advanced designs so you can focus on the rescue.

All trademarks are registered and/or unregistered trademarks of Pelican Products, Inc., its subsidiaries and/or affiliates.

AUSTRALIA

Pelican Products Pty Ltd
Suite 2.33, Platinum West
4 Iya Avenue, Erina NSW 2250
Tel: +612 4367 7022 • Fax: +612 4367 7066
www.pelicanaustralia.com

NEW ZEALAND

Chubb Fire and Safety
3 Fisher Crescent
Mount Wellington, Auckland 2023
Tel: +64 (0)9 270 7234 • Fax: +64 (0)9 270 7235
www.chubb.co.nz

When asset protection matters most. DuPont™ FM-200®

DuPont™ FM-200® clean agent can reach extinguishing levels in 10 seconds or less, stopping ordinary combustible, electrical, and flammable liquid fires before they cause significant damage. When fire is extinguished that quickly, it means less damage, lower repair costs, and an extra margin of safety for employees and valuable assets—making it easier to keep your business running smoothly.

Make sure your business is protected with the most widely specified clean agent in the world. Get maximum protection with DuPont™ FM-200®.

1.800.473.7790
cleanagents.dupont.com



DuPont Fire Extinguishants. The Science of Protection.™



The miracles of science™



Fire Suppression – Keep It Clean



By Graham Collins

The United Nations Environment Programme has recently published a report on clean agents and the next edition of APF will carry an exclusive article on the report written by one of the committee's members, John O'Sullivan. As a prelude, Graham Collins, APF's Editor, overviews the major developments since the Montreal Protocol with Janus Fire Systems' Fred Hildebrandt.

Right up to the closing years of the 1960s, CO₂ [carbon dioxide] was pretty much the only available "clean" – more on that word later – gaseous fire-suppression agent. Halon gases became commercially available in the late 1960s and were soon adopted as an alternative to CO₂, particularly for the protection of areas where people might be present. This was because CO₂ is most certainly not suitable for total flooding applications in normally occupied rooms or enclosures, as its discharge in fire extinguishing concentrations is lethal to room occupants.

However, as Fred Hildebrandt, Director of Sales at Janus Fire Systems – a man with 34 years gaseous agent suppression system experience – points out: "CO₂ continues to this day to be a popular, versatile and effective fire suppression agent for the total flooding of unoccupied, enclosed, special-hazard areas such as power generation equipment, spray booths and turbines. When discharged, it leaves nothing behind to damage sensitive equipment, and with no agent clean-up required, business-critical installations can be up and running again in the shortest possible time."



It remains popular also because it can be compressed into a liquid state which, when maintained under pressure, requires a smaller storage footprint than many other gaseous suppression agents. An essential consideration though is to ensure that the flooded areas are adequately ventilated after discharge to prevent the accidental exposure of personnel to dangerous levels of CO₂ when investigating the cause of the discharge.

Not that CO₂ is free from misunderstandings. It is close to impossible to go anywhere in the world today without hearing carbon dioxide mentioned, often in the same breath as terms such as carbon footprint and global warming. So it is easy to

industrial processes, particularly in some of the fast-developing emerging nations.

Halon and the Montreal Protocol

From the late 1960s until the signing of the Montreal Protocol halon was a much favoured gaseous fire suppressant, particularly for occupied areas such as computer suites, telecommunications facilities, areas containing high-value electronic equipment, document storage, archives and research facilities.

Of the halons, Halon 1301, a CFC (chlorofluorocarbon) with the chemical name of bromotrifluoromethane and a chemical formula CBrF₃, was

From the late 1960s until the signing of the Montreal Protocol

Halon was a much favoured gaseous fire suppressant, particularly for occupied areas such as computer suites, telecommunications facilities, areas containing high-value electronic equipment, document storage, archives and research facilities.

forget that CO₂ continues to be a very effective fire suppressant and that, in all probability, has been used to safely extinguish more fires in unoccupied areas than any other gaseous suppressant for the better part of 100 years.

So, what are the facts? Carbon dioxide occurs naturally in the atmosphere, and the gas used as a firefighting suppressant is extracted from a number of natural CO₂ producing processes. It is then stored until it is needed. Also, its use in fire protection is insignificant compared with the emissions and environmental damage caused by an uncontrolled fire, or the huge quantities of CO₂ emitted into the atmosphere as a by-product of many

by far the most popular as a gaseous fire suppression agent. It extinguished fire by chemically interrupting the chain reaction inhibiting flame propagation. Halon 1301 was a first-class fire suppressant but, unfortunately, the same could not be said for its environmental credentials.

By the mid-1980s scientific evidence showed that these halogenated hydrocarbons were contributing to the depletion of the stratospheric ozone layer. Halon 1301 had ozone depletion potential of 12, global warming potential of 6900, and an atmospheric lifetime of 65 years that was wholly unacceptable to the international community. So, despite its undeniable effectiveness as a

Manufacturer and Designer
of Globally Approved
Fire Extinguishing Systems



Clean Agent

High Pressure Carbon Dioxide

Low Pressure Carbon Dioxide

Water Mist

Foam

Alarm and Detection

Air Sampling Smoke Detection

YOUR GATEWAY TO A NEW KIND OF SERVICE.

+1 219-663-1600 • www.janusfiresystems.com

1102 Rupcich Drive, Crown Point, IN 46307



FIRERAY® Optical Beam Smoke Detectors

Low cost, field-proven fire protection
for large open areas



Dubai Airport, Terminal 3



When it comes to optical beam smoke detectors no other company has the experience, or the product range, of Fire Fighting Enterprises. **FIRE**RAY® offers both reflective and end-to-end models and ATEX approved units for hazardous areas, encompassing all applications.

With over 650,000 beams installed worldwide, including in some of the world's most prestigious buildings, it is clear that the **FIRE**RAY® series is the choice for both installers and specifiers.



FIRERAY® - The leading
light in smoke detectors

T +44 (0) 1462 444 740 F +44 (0) 1462 444 789 E sales@ffeuk.com W www.ffeuk.com



suppression agent, Halon 1301's demise came when the Montreal Protocol came into effect in 1989.

The Montreal Protocol, or to give it its full name, the Montreal Protocol on Substances that Deplete the Ozone Layer is a protocol to the Vienna Convention for the Protection of the Ozone Layer. It is a treaty aimed at protecting the stratospheric ozone layer by phasing out the production of numerous substances believed to be responsible for ozone depletion. This included CFCs – such as Halon 1301 – and HCFCs (hydrochlorofluorocarbons), resulting in a flurry of activity to develop alternative, sustainable, environmentally-acceptable and long-term agents. Some turned out to be more successful than others.

Kyoto and Copenhagen

The next chapter came in 1997 with the signing of the Kyoto Protocol on climate change – a protocol to the United Nations Framework Convention on Climate Change (UNFCCC or FCCC), aimed at achieving “stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system”, fighting global warming and establishing the goal of reducing greenhouse gas emissions.

The United Nations Climate Change Conference – more commonly known as the Copenhagen Summit – took place in 2009 in Copenhagen,

Denmark. It was the 15th “Conference of the Parties” to the United Nations Framework Convention on Climate Change and the 5th “Meeting of the Parties” to the Kyoto Protocol. The aim was to agree a framework for climate change mitigation beyond 2012, the date on which the Kyoto Protocol is set to expire. It followed the Climate Change: Global Risks, Challenges and Decisions scientific conference that took place in March of last year. The consensus of opinion was that the Copenhagen Summit failed to live up to many people's expectations.

Halon replacements

One firefighting agent that became particularly popular following the Montreal Protocol was FM-200 (HFC-227ea), a halocarbon or HFC (hydrofluorocarbon) suppressant with the chemical name of heptafluoropropane. Another popular halocarbon suppressant is HFC-125/FE-25, which has a chemical name of pentafluoroethane. With either, there is no risk of thermal shock damage to delicate equipment, they are electrically non-conductive and non-corrosive, leave no oily residue or deposits to damage computer software, data files or communications equipment so clean-up operations are unnecessary following discharge.

However, the Kyoto Protocol specifically sought to cap the emissions of greenhouse gases from, among others, HFCs that almost inevitably has led to questions continuing to be asked about its viability. Firefighting though, as Fred Hildebrandt underlines is: “A very minor user of HFCs, and the applications causing the most concern for groups such as the United Nations Environment Programme are insulation foams, air conditioning units and refrigeration.”

He continues: “Both FM-200 and HFC-125/FE-25 extinguish a fire through heat absorption; they are zero ozone depleting, have global warming potentials significantly lower than Halon 1301, and have far shorter atmospheric lifetimes.” He explains: “Global warming potential is a measure of how much a given mass of a gas is estimated to contribute to global warming. CO₂ has a global warming potential of 1 and is the baseline against which all greenhouse gases are compared.”

Inert gas option

Understandably, the Montreal and Kyoto protocols focused greater interest on inert gases that can justly claim to have no environmental downside. They have zero ozone depletion potential, zero atmospheric lifetime and zero global warming potential. Inert gases are non-toxic, they will not harm sensitive electronic equipment, art treasures or documents, and are safe to use in enclosed areas where people may be working.

These gases are a non-conductive and non-corrosive blend of naturally occurring gases – such as a combination of N (Nitrogen), Ar (Argon) and CO₂ – or, less frequently, a single naturally occurring gas. They work by lowering the oxygen content of the protected area to a point that will not support combustion but is sufficient to sustain human life, in much the same way as CO₂, but without the lethal implications.

So, why have inert gases not been overwhelmingly adopted? According to Janus' Fred Hildebrandt, the fact of the matter is that HFCs are ideal fire fighting agents and are most appropriate where speed of suppression, space for cylinder storage and weight are the determining factors. Inert gases are most appropriate where speed of discharge is considered to be of less importance and where there is considerably more space available for cylinder storage. He argues: "Typically, an inert gas system requires up to seven times the storage space of FM-200 and ten times the storage space of a comparable Halon 1301 system." That being said, inert systems are certainly popular with companies where specifying a zero ozone depleting, non-chemical product is of paramount importance.

The suppressant is stored as a low-vapour-pressure fluid that, when discharged, transmutes into a colourless and odourless gas. Typical total flooding applications use a concentration of the fluid that is well below the agent's saturation or condensation level, and the fluid has the lowest design concentration of any viable Halon 1301 chemical alternative.

Post-Kyoto agents

Following the Kyoto Protocol it became clear that there was a need for a chemical suppressant that met the industry's needs, while satisfying the environmental lobby. One of the most successful of these is 3M's Novec 1230 Fire Protection Fluid, a fluid-based system that is said to use sustainable, long-term technology.

Novec 1230 is a fluorinated ketone or fluoro-ketone – a low toxicity, low vapour pressure fluid, with a boiling point of 49°C, that exists as a liquid at room temperature, with a chemical structure of CF₃CF₂C(O)CF(CF₃)₂. This molecule was chosen because it provides an ideal combination of fire extinguishing performance, toxicological and environmental properties. The suppressant is stored as a low-vapour-pressure fluid that, when discharged, transmutes into a colourless and odourless gas. Typical total flooding applications use a concentration of the fluid that is well below the agent's saturation or condensation level, and the fluid has the lowest design concentration of any viable Halon 1301 chemical alternative.

While certain halocarbons and inert gases are used at design concentrations that are below the NOAEL or No Observed Adverse Effect Level, with safety margins from seven percent, no other fire suppression solution comes close to Novec 1230's safety margin. NOAEL is an important measure, as it represents the level of exposure at which there is no biologically or statistically significant

increase in the frequency or severity of any adverse effects.

Fred Hildebrandt cites the key benefits of Novec 1230 as: "Novec 1230 is a high performance fire-extinguishing agent with a negligible impact on the environment, with an insignificant global warming potential – lower than any of the halo-carbon agents acceptable for use in occupied spaces." He continues: "When discharged, Novec 1230 leaves nothing behind to damage sensitive electronic equipment or documents. Compared with Halon 1301's ozone depletion potential of 12, Novec 1230's is zero; its global warming potential is 1 against Halon's 6900; and the agent's atmospheric lifetime is five days, contrasting with Halon's 65 years. It contains neither bromine nor chlorine and, significantly, Novec 1230 is not included in the basket of 'greenhouse gases' identified by the Kyoto Protocol."

What is clean?

But, with so many options on the market, what is "clean"? The USA's NFPA (National Fire Prevention Association) 2001: 2008 (*Standard on Clean Agent Fire Extinguishing Systems*) covers both halogenated agents and inert gases. The 2008

update includes the latest toxicity limitations along with complete facts on the different types of halogenated and inert gaseous extinguishing agents on the market today. Another important feature of this edition is that it includes additional references to US EPA (Environmental Protection Agency) SNAP (Significant New Alternatives Program) approved agents.

SNAP evaluates and regulates substitutes for the ozone-depleting chemicals that are being phased out under the stratospheric ozone protection provisions of the USA's Clean Air Act. Under the Clean Air Act, the EPA, which was created in 1970 in response to growing public demand for cleaner air, water, and land, is authorised to identify and publish lists of acceptable and unacceptable substitutes for Class I or Class II ozone-depleting substances. Novec 1230, for example, is listed as "acceptable without restrictions". Other sources of information are the Europe Commission's Joint Research Centre Institute for Health and Consumer Protection's ELINCS (European List of Notified Chemical Substances) scheme, BS ISO 14520 (*Gaseous fire-extinguishing systems. Physical properties and system design*) and the Australian Standard AS ISO 14520:2009.

Few would doubt that the drive for ever improving environmental performance is inexorable. Perhaps John O'Sullivan's article in the next edition of APF will help us all to see just how far we still have to go.

APF

Fred Hildebrandt is Director of Sales at Janus Fire Systems

For more information go to www.janusfiresystems.com

FIRE SUPPRESSION • FIRE ALARM FIRE SOLUTIONS

**FM-200®**

Waterless clean agent
fire suppression

ECARO-25®

Cost-effective clean agent
fire suppression

PROINERT®

Inert gas system
with unique patented
flow control valve

CYBERCAT®

Comprehensive line of
intelligent fire alarm
control systems

**PRECISE® &
SIGNIFIRE™**

Event management and
Video smoke systems

**NEW
INTEGRATED
VOICE
EVACUATION**

For over 30 years, Fike has provided reliable and innovative fire protection systems. Today, Fike systems are trusted around the world. We have application experts in key regions to provide fast, responsive service. In addition to our well known clean agent product line, we offer a complete fire alarm system with the flexibility to meet a variety of application needs.

Fike®

WWW.FIKE.COM
+60-3-7859-1462



Bushfires

– A Vision Of The Future

By David Goodrich

FireWatch Australia

Scientists are predicting that bushfires will become more common in Australia due to climate change, so early detection now tops the bushfire agenda.

While predictions for climate change sometimes appear to be contradictory, there is no disputing that vast tracts of the globe are experiencing extreme weather conditions. Within the past month, research scientists from NASA's Goddard Institute for Space Studies have concluded a study showing that climate change could likely become the principal driver for future wildfires and bushfires if current CO₂ levels continue to rise unabated.

Their findings, published in the highly-regarded Proceedings of the National Academy of Sciences, include a new wildfire model that has produced the first long-term history of global burning. It predicts large increases in fire activity in India, Australia, central Asia and Siberia, southern Europe, and southern Africa.

It is necessary to consider only recent events. For example, Russia's devastating summer heat-wave – the worst since records began 130 years ago – cost almost 5,000 lives, and the country fought to quell the worst wildfires in decades. And the impact of the devastating 2009 bushfires in Victoria, Australia is still reverberating. There is little disputing that Australia is becoming hotter and dryer and, as a direct consequence, is experiencing more frequent and more dangerous bushfires.

The cost of these fires is staggering. Early estimates of the cost to the Russian economy suggested the final toll would top US\$15 billion, and some claims adjusters believe that the total insurance costs for the Victoria Black Saturday fires have amounted to AU\$1.5 billion, though the recent Royal Commission calculated the total cost to be AU\$4.0 billion. It has been estimated that the Black Saturday and subsequent bushfires in Victoria emitted the equivalent of one year's worth of industrial emissions. So, alongside the alarming environmental impact of these fires, the loss of life and destruction of property and the devastation wreaked on the infrastructure, it is evident that measures that ensure early detection – and hence early suppression – have to be money well spent.

Where there is smoke . . .

Smoke detection inside buildings has been established for many years and is getting ever more sophisticated and reliable. Smoke detection in the external environment too has moved ahead apace and today offers high-risk countries with large tracts of land covered in bush, forests and combustible crops the best prospect of stopping either a natural or man-made bushfire, wildfire or forest fire in its tracks.



In Germany, for instance, over the past eight years areas of forest burnt have been reduced by more than 90 percent using an automatic smoke detection system called FireWatch. This year there was a particularly impressive endorsement of the system's capability when a fire was detected at a distance of 72 kilometres from the tower. Today, Germany has 178 tower-based FireWatch sensors that are monitored by 22 control centres, covering an area of 2.4 million hectares of forest.

In excess of 200 of these systems have been installed worldwide and are now either operating or are being trialled in France, Portugal, Estonia, Czech Republic, Greece, Lithuania, Holland, the US, Mexico, Italy, Cyprus, Croatia, Serbia, Montenegro and Kazakhstan.

A new model developed by scientists at NASA's Goddard Institute for Space Studies is predicting large increases in bushfire activity in India and Australia.

Trials of the same technology, funded by the Australian Federal Government after the Black Saturday bushfires were undertaken in 2009 and 2010 with the result that 347 fire events were detected, ten percent of which occurred at night. FireWatch sensors were sited at four locations in Victoria, with the data being fed back to a control room at the Deakin University campus at Burwood. A small number of controlled tests were undertaken by the Bushfire CRC (Cooperative Research Centres) and the Commonwealth Scientific and Industrial Research Organisation (CSIRO) in New South Wales over a twelve-day period.

How it works

This particular system is based on aerospace technology developed for the NASA Mars Pathfinder

mission, and monitors the landscape using a sophisticated sensor unit to collect data. These sensors are mounted on existing telecommunications masts or fire towers and rotate a full 360 degrees every four to eight minutes, with the sensor capturing three images in every ten degrees slice of the rotation – a total of 108 images for each rotation. A combination of 36 images is formed into a panoramic view. This is fed back to the central system in a remote control room, and each control room workstation controller can monitor up to six towers, covering a potential area of more than 15,000 square kilometres for each six-sensor workstation, although this depends on the topography of the area being covered.

Each of these sensors has a detection range of between 50 kilometres and 60 kilometres – depending upon topography – with a visual field resolution of 1280 by 1024 pixel

CCD (Charged-coupled Device) depending on the lens configuration. Significantly, the system does not need to see flames before it raises an alert. The sensor works by detecting the difference between 16,384 shades of the colour grey, and has a number of sophisticated mathematical algorithms that can discern the unique characteristics of smoke. This means that, in many instances, it can differentiate between bushfire smoke, fog, cloud or mist.

Once bushfire smoke has been detected the system alerts the control room, where further analysis by experienced fire fighters, forestry professionals or fire spotters can determine if the alert is a fire of concern. This analysis minimises the chance of a false alarm being sent to the authorities that would lead to the misallocation of scarce firefighting resources, wasting time and money.

Using embedded GPS mapping, the sensor has the ability to pinpoint the exact location via topographical data, authorities are given the precise location of the fire and can promptly deploy the right resources. The information from the sensor also provides vital information about the size of the fire, how fast it is moving and the direction in which it is travelling. This is achieved by using a selection of meteorological information as well as the skills and field experience of the fire spotters, volunteer firefighters or forestry professionals operating the system. Depending upon user requirements and data availability, the FireWatch system can also provide firefighters with temperature, wind speed and direction, humidity and vegetation-related information

Day and night surveillance

FireWatch sensors operate in real time, 24 hours a day, every day of the year.

The optical sensor incorporates enhanced spectral sensitivity with near-infrared (NIR) sensing capabilities. This permits detection across a wide range of visible light wavelength (480nm to 1200nm) day or night. This is far superior to that of the human eye/CCTV that has a range of only 400nm to 750nm.

APF

David Goodrich is
Managing Director of
FireWatch Australia

For more information go to
www.firewatchaustralia.com.au

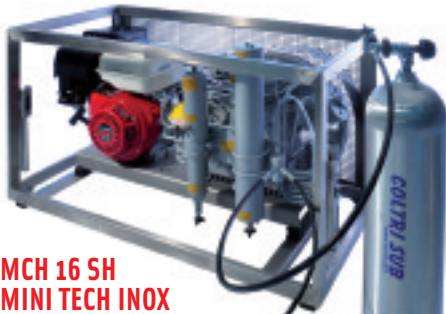
COLTRI[™] COMPRESSORS

PURE BREATHING COMPRESSED AIR DEPENDABLE TECHNOLOGY



MCH 30 SILENT WITH DRIER

500 Lt/min - 18 CFM, Fully automated, Stationary filling station, The refrigerated air drier extends filtration media lifespan 6 times



MCH 16 SH MINI TECH INOX

265 Lt/min - 9.5 CFM, Light weight, Highly reliable, Portable station, Marine grade, Stainless steel frame, Also available with diesel and electric drive



MCH 6 SH

Ultraportable 100 Lt/min - 3.5 CFM, Small compressor only 37 Kg, Also available with single and triphase 3 Kw electric drive

Coltri Asia Pacific Co., Ltd.

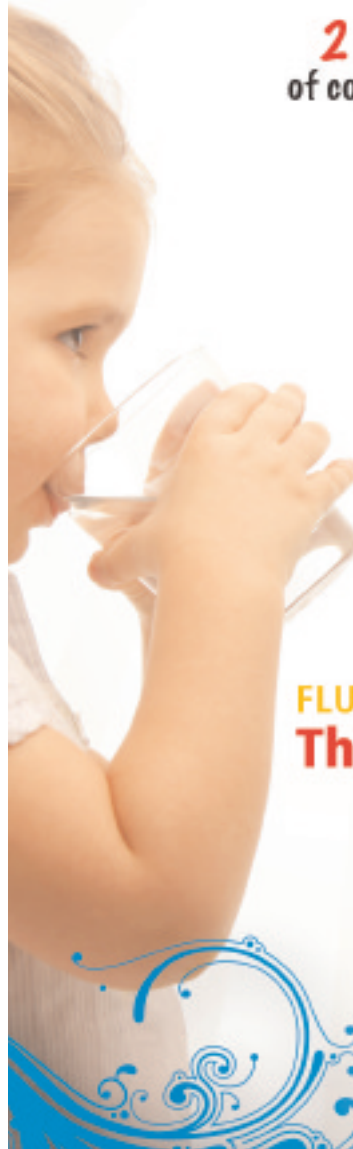
Free Zone at 304 Industrial Park 2 No. 94/5, Moo. 3, T. Khao Hin Sorn - A. Phanomsarakarm, Chachoengsao 24120 Thailand

Tel: + 66 38 855 103 to 5 Fax: + 66 38 855 106
mobile +66 81 8913937

c.benelli@aerotecnicacoltriasiapacific.com
www.aerotecnicacoltriasiapacific.com



1 Ton
of AFFF
=
10 kg
of fluorosurfactants (PFC)
=
2 Million M3
of contaminated water



FLUORINE FREE Foam
The alternative

www.bio-ex.com

BAUER COMPRESSORS

Mini Verticus III Series



The most advanced compact unit system used in Fire Stations and Vehicles. The system can deliver air up to 250l/min and can be upgraded to fully automatic with refrigeration dryer Air-Kool system, external filling panel as well as storage cylinders can be easily fitted.

Containment Fill Stations – Stationary and Mobile

BAUER offers only independently tested Containment Fill Stations which were found to protect the operator from overpressure and fragmentation per NFPA 1901.



BAUER Pure Air

As market and technology leader in the field of breathing air production, BAUER is fully aware of her responsibilities and therefore started a worldwide information and quality campaign for a quality seal for pure and safe breathing air according to DIN EN 12021 which is in cooperation with TÜV.

BAUER COMPRESSORS ASIA PTE LTD



2 Penjuru Place, #01-05 Penjuru Tech Hub,
608783 Singapore
Tel: +(65) 6271 6271 Fax: +(65) 6272 3345
<http://www.baugroup.com>
Email: info@bauer-compressors.com.sg



PROTECTING THE WORLD'S FIREFIGHTERS



Bristol - A global force in firefighter protection

Relied upon by firefighters in over 110 countries, Bristol can confidently claim to be a global leader in the specification, design and manufacture of firefighters' personal protective equipment (PPE). We deliver our world class products and support services through a network of 70 specialist distributors worldwide, while commanding a dominant share of the UK market.

Bristol Uniforms Ltd

Bristol, United Kingdom, BS16 5LL
Tel: +44 (0) 117 956 3101
enquiries@bristoluniforms.com
www.bristoluniforms.com





By Graham Collins

CBRN – Protecting The Protector

CBRN attack, in whatever form it takes, is a very real and potentially catastrophic threat that affects every corner of the world. Meeting the challenge puts lives at risk; lives that need the best available resources and protection.

CBRN is an initialisation of chemical, biological, radiological and nuclear that is commonly used worldwide to refer to incidents or weapons in which any or all of these four hazards may be present. The term has its origins in the Cold War, when the risk was called NBC and stood for nuclear, biological, and chemical. This, in turn replaced the term ABC or atomic, biological, and chemical threat that was used in the 1950s. The “R”, for radiological, reflects the newer threat of a radiological weapon – sometimes called the “poor man’s atomic bomb”. Since the start of the new millennium, a new term – CBRNe – has begun to be adopted, with the “e” representing the enhanced, improvised explosives threat. However, these are more often aimed at causing mass disruption rather than mass destruction.

Personal protection

Personal protection equipment (PPE) for those responding to a CBRN emergency must be uncompromisingly effective if the emergency and its

aftermath are to be handled without the responders being put at considerable risk.

While speed is obviously essential and the PPE needs to be easily accessible and quick to put on, having a comprehensive range available to suit all possible CBRN threats is equally important. It must provide the maximum protection, be lightweight, easy to move in and cause the least amount of physical stress when in use; it is also essential that first responders are familiar with the equipment that is available to them; training is, therefore, imperative.

Protective clothing

The first-responder to a CBRN incident must be fitted out with a complete set of personal protection equipment that meets the required levels of comfort and protection. This includes protective clothing, helmets, goggles, and any other garment or items designed to protect the responder against chemical permeation, heat, infection, electrical hazards, abrasion and impacts.

Protective suits

The use of fully encapsulated gas-tight, chemical-protective suits is standard for monitoring and inspecting CBRN incidents, as well as mounting rescue, containment or clean-up operations. They are available as either limited-life or reusable suits, in single-skin or multi-layer designs and, depending on the particular manufacturer, have a number of key features. These include built-in respirators, drinking tubes to enable user hydration without breaking the suit's protective seal, and varying usable-life characteristics.

Single-skin suits have the benefit of weighing less than multi-layer suits; around 3.5 kilograms lighter is one quoted weight reduction. This may not seem a considerable amount, but responders can be carrying anything up to 18 kilograms of equipment! They are also regarded as providing the responder with greater mobility, allowing the wearer greater manoeuvrability of hands, arms, and body.

The importance of material selection was demonstrated with the launching of a new suite by one of the leading PPE clothing manufacturers, Saint-Gobain Performance Plastics. The new single-skin design ONESuit Pro is a limited-life chemical-protective gas-tight suit that offers fire, chemical, military and industrial organisations certified protection against chemical and biological agents. Customised versions for industrial, emergency team and chemical, biological, radiological, and nuclear situations are available. They are certified to both EN 943-1 and EN 943-2, the highest level of certification recognised in both the EU and Asia.

The suits exceed significantly the requirements for tensile strength, flex-cracking and puncture resistance. Along with EN certification, the ONESuit Pro line is certified to both NFPA 1991 and NFPA 1994.

The patent-pending CoreTech Barrier Membrane technology enables the lightweight – under 5 kilograms – suits to protect against chemical and biological agents in both liquid and vapour form and offers superior flame resistance.

Protective undergarments

Chemical protective undergarments (CPU) provide a level of protection against a range of potentially hazardous chemical and biological agents. Typically they comprise a long-sleeve jacket, trousers, booties, gloves and balaclava and significantly reduce heat stress, provide outstanding vapour and aerosol protection, and enhance flash fire protection.

Protective over-boots

These come in a number of variants, including chemical resistant, dielectric insulating, electrical resistant, anti-static, and boots specially designed to be worn with disposable protective suits.

Protective gloves

Dexterity is the essential characteristic of protective gloves. Some traditional multi-layer gloves have been criticised for limiting hand and finger movement. They have also been shown to have a tendency to invert when removing the hand, making speedy replacement of the hand into the protective glove a near impossibility. Single-piece gloves overcome these challenges.

Over-gloves may be worn over chemical

protective gloves to provide an enhanced level of cut resistance and improved hot and cold insulation.

Protective equipment

Respiratory protective equipment

There are many types of respiratory protective equipment (RPE) on the market, making selecting the correct type a complicated business. However, making the right choice is essential as different types of RPE give protection against only specific types of chemicals.

There are two main types. The first is APR and PAPR respirators that filter substances from the ambient air (negative-pressure air purifying respirators and powered air purifying respirators). The most efficient particle filters are also the hardest to breathe through, and as a result are uncomfortable and tiring to wear, a challenge overcome in the powered variant. The second type of respirator is SCBA equipment that supplies clean air to the responder (positive-pressure, self-contained breathing apparatus).

Equipment offering both are now available that provide the responder with the ability to switch between APR protection and SCBA protection, enabling them to maximise their time on the incident site.

Communications equipment

Effective communication significantly improves CBRN incident command and control and vastly improves responder safety.

An electronic voice amplifier can be integrated with some respiratory masks that improves the clarity of speech and the distance a voice will carry when the responder is wearing a mask. Communications systems are also available that combine voice amplification and two-way radio interface to provide clear, crisp voice transmission and reception. The voice amplification element can be used independently by uncoupling a quick-disconnect to the radio interface cable.

Other communications equipment options on the market include hands-free devices and wireless person-to-person communication devices.

No compromise

Recently, members of the USA's bi-partisan Commission on the Prevention of WMD (Weapons of Mass Destruction) Proliferation and Terrorism concluded a study and released a report stating that: "...the world can expect a terrorist attack based on nuclear or biological materials by the year 2013." The report went on to state that the weapon of choice will most likely be biological, and cites direct evidence that terrorists are seeking WMDs. It is doubtful that current procedures and technologies such as checkpoint screening techniques will be effective in preventing or mitigating the effects of the use of CBRN weapons. The U.S. Department of Homeland Security has recognised this vulnerability and listed CBRN security as a high priority for U.S. infrastructure protection.

But is not just the USA that is threatened; we are all at risk. So, protection against potential terrorist attacks and other serious threats remains an enduring need, consequently the purchase of CBRN personal protection equipment is not a time to cut corners. Lives are at risk and, in the most serious incidents, the very fabric of a society may be under attack.

APF

SARATOGA®
Blücher Technologies

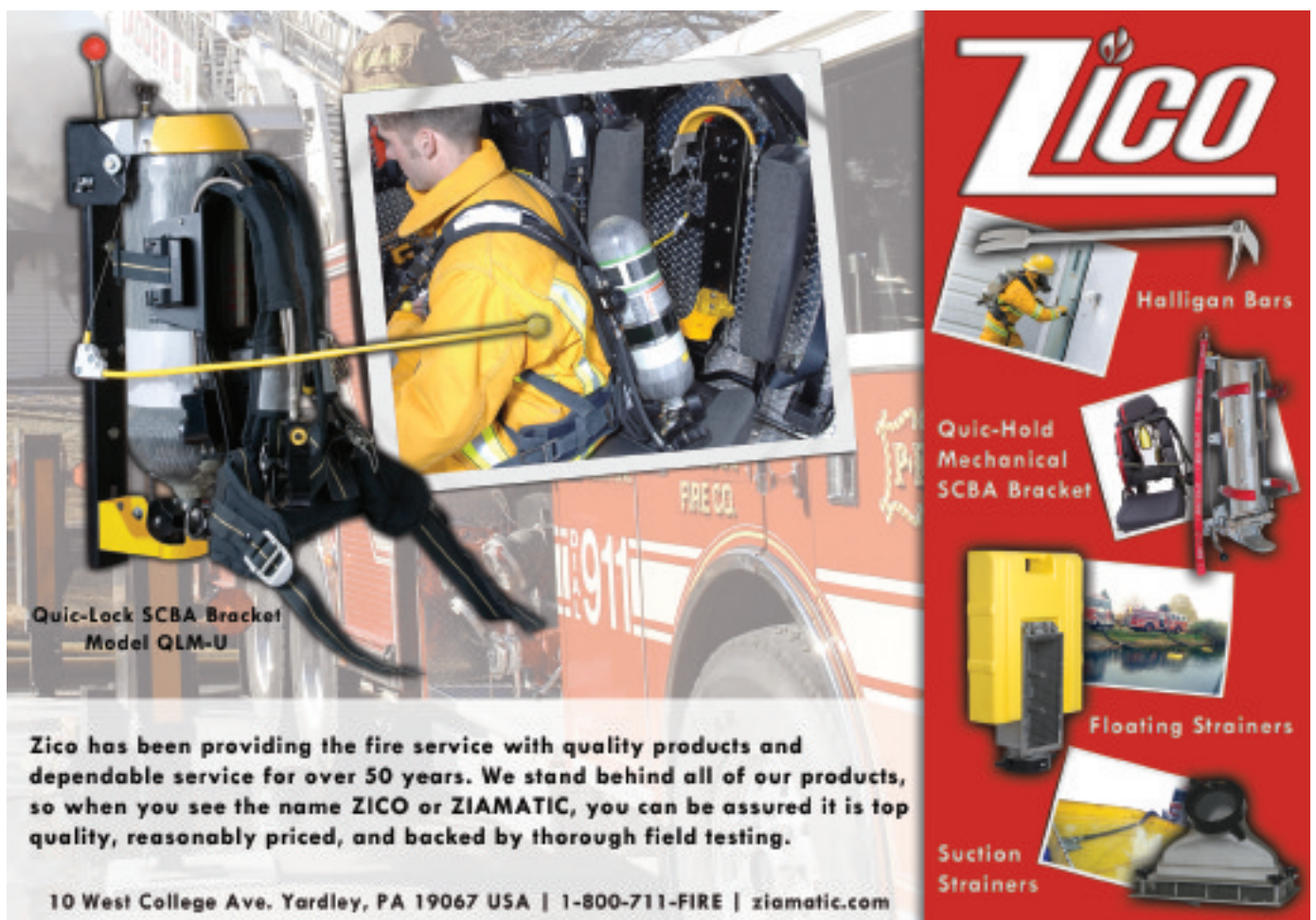
FULL SPECTRUM PROTECTION WE GO BEYOND

BLÜCHER GmbH
+49 211 9244 0 phone
+49 211 9244 211 fax
info@bluecher.com
www.bluecher.com

BLUECHER UK Ltd.
+44 1507 451 443 phone
info@bluecheruk.com
www.bluecher.com

BLÜCHER SYSTEMS GmbH
+49 2153 9540 0 phone
+49 2153 9540 70 fax
info@bluechersystems.com
www.bluechersystems.com

BLÜCHER®
Innovation since 1214



**Quic-Lock SCBA Bracket
Model QLM-U**

Zico

Halligan Bars

**Quic-Hold
Mechanical
SCBA Bracket**

Floating Strainers

**Suction
Strainers**

Zico has been providing the fire service with quality products and dependable service for over 50 years. We stand behind all of our products, so when you see the name ZICO or ZIAMATIC, you can be assured it is top quality, reasonably priced, and backed by thorough field testing.

10 West College Ave. Yardley, PA 19067 USA | 1-800-711-FIRE | ziamatic.com

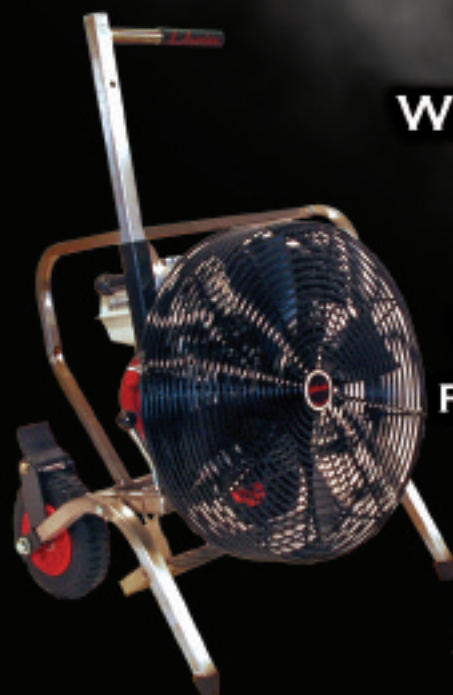
UNIFIRE

MANUFACTURERS OF HIGH PERFORMANCE EQUIPMENT



WHEN TIME MATTERS.
WHEN LIVES ARE AT STAKE.
WHEN SAFETY IS KEY.

CHOOSE THE BRAND
THE TOP TRAINING AND
RESCUE TEAMS CHOOSE.



UNIVENT BRAND SAWS ARE A DIVISION OF UNIFIRE

1-800-745-3282 • WWW.UNIFIREUSA.COM

Fire and rescue service at the Southern Link tunnel in Stockholm



Tunnel Fire Safety

– Assessing The Risk



**By Professor
Haukur Ingason**

SP Technical Research
Institute of Sweden

Fires in road tunnels can be very serious and difficult to fight. In addition to the necessary resources, there must also be proper incident planning. SP Technical Research Institute of Sweden has carried out an investigation into how best these problems can be solved.

SP Technical Research Institute of Sweden suggest a tunnel classification system that takes account of the time taken for the rescue services to reach the site, possible incident scenarios, the type of tunnel and the traffic situation. This classification system can provide important assistance to road authorities when holding discussions with fire and rescue services before the tunnel is constructed.

The serious tunnel fires that have occurred in Europe and in other parts of the world have focused attention on the problems that the fire and rescue services face when tackling fires in road tunnels. They need to be capable of adjusting their response to suit different conditions, although very little research has been conducted to date in this area, even though it is widely accepted that this is an important safety area, not just for the fire and rescue services but also for tunnel users, tunnel operators and tunnel owners.

Assessing the risks

We started by studying real incidents in road tunnels. From this we could identify four incident scenarios, depending on whether the fire had started in an individual vehicle, or as a consequence of a collision between vehicles. It was clear that the risk of a large, extensive fire was considerably greater if it was a result of a collision.

The types of vehicles involved were also found to be significant. For each incident scenario, we developed different potential heat release rate curves. The reason for distinguishing between incident scenarios and fire scenarios is that there are several different parameters that determine which fire scenario is the most likely. These scenarios will be used as input data for assessing the risks and opportunities for tackling fires any particular tunnel concerned.

Tunnels in which there is a substantial risk of a catastrophic fire require more comprehensive

TUNNEL FIRES

countermeasures in order to reduce the risks of serious consequences. This can be done both by taking steps to reduce the risks of an accident, or by limiting the consequences of a fire through appropriate planning, tactics, resources or physical installations/services.

The reason for distinguishing between incident scenarios and fire scenarios is that there are several different parameters that determine which fire scenario is the most likely.

The basic needs

We have focused on several key elements for effective firefighting operations in road tunnels, and examined and discussed various environments to give a general idea of how to improve the planning of firefighting in road tunnels. For example no two tunnels have the exact same geometry, traffic flow or technical fire safety standards; every tunnel has its own geographic or environmental characteristics.

It is the responsibility of the local fire and rescue services to develop specific operational procedures

for each tunnel. The information and fire operational proposals presented in this study can provide better ideas for setting up the fire and rescue plans as a support for tactical procedures. We find that the following list can facilitate the planning of the operational procedures issues that should be considered and solve – wherever possible – prior to an incident:

Apparatus and equipment

- Breathing apparatus: What types and what capacity is necessary for firefighting and rescue works?
- Nozzle type: What types of nozzles – jet or spray – should be employed for each operation?
- Optimum pressure and volume per minute of discharging water?
- What extinguishing agent is effective for fires in tunnels, for instance, water or foam?

Firefighting personnel

- Staffing of the first response units and, if necessary, rescue teams.
- Staffing of supporting units, such as ventilation and water-supply units.

Water supply

- How much water is required to extinguish different types of fires?
- How can an adequate water supply be obtained?
- How can the required water be relayed to the fire site?



So fire risks can leave you cold.

SecuriFire – the redundant modular fire detection system with SpiderNet technology

Securiton AG, Alarm and Security Systems
www.securiton.com, info@securiton.com
A company of the Swiss Securitas Group



For your safety

Location of fire and rescue services

- Organisation of first response teams at each portal.
- Distance between public fire service and the both ends of the tunnels.

Tactical positioning

- The position of the first and later arriving fire units.
- Hose placement of initial and back-up lines.

Some of the considerations above are not well studied, so more research is needed on these issues. However, our aim is to inspire fire authorities to pay more attention to the various issues regarding firefighting and rescue operations in road tunnels, and highlight the need for more effort to be put into solving presently unsolved problems.

Our aim is to inspire fire authorities to pay more attention to the various issues regarding firefighting and rescue operations in road tunnels.

For example, it seems odd that when a risk analysis at the design stage of a new tunnel is carried out, considerations on the response capacities of the local fire and rescue services, such as distance between fire stations and the tunnel, and the number of firefighters and fire engines available, are not included in the risk analysis process.

Fire service capability

An important question is how large a fire can the fire and rescue services deal with in tunnels, as the response time is an important aspect when considering possible capacity. In our study the response time of average-sized fire service units, and the maximum intervention time for various scenarios of fires, are given in order to determine the subsequent operations. It was found that an average-sized fire service unit manages to control

Very little information is available to try to give a maximum intervention time, and there is still a need for more research on this topic.

a fire that starts in an HGV but does not involve a trailer loaded with combustible materials. It can manage fires that are in the range of 20 to 30 MW when the active firefighting operation starts fast enough. This implies that a fire occurring in passenger cars, buses or both can be managed by the first fire service units arriving.

Very little information is available to try to give a maximum intervention time, and there is still a need for more research on this topic. However,

based on the very limited information available, it is argued that collision fires should be fought within seven minutes and single fires should be tackled somewhere between 13 and 20 minutes in order to ensure control of the initial fire. Depending on two criteria – that is the response time limit and maximum response time – appropriate strategies should be selected that determine other operational procedures such as access routes and the direction of air flow from ventilation systems.

New classification method

The proposed classification model is based on four parameters: passage of an HGV and vehicles carrying dangerous goods; type of tunnel; risk of congestion; and response time, where the response time is the most crucial parameter for firefighting and rescue operations. Depending on the classification we come up with the following four classes (I, II, III, IV). The classification model

Super Vac SVU Blows Up a 425,000 cmh Windstorm!

The Super Vac SVU is useful in situations where a district includes large retail outlets, warehouses, public sites, tunnels, or airports. It can easily mount on trailers, skids, or trucks. Optional features include, lift, tilt, rotation, water misting and lighting. Contact your dealer for more details on **"The Most Powerful PPV Available"**



Scan with your iPhone, Android device, or BlackBerry to see video.

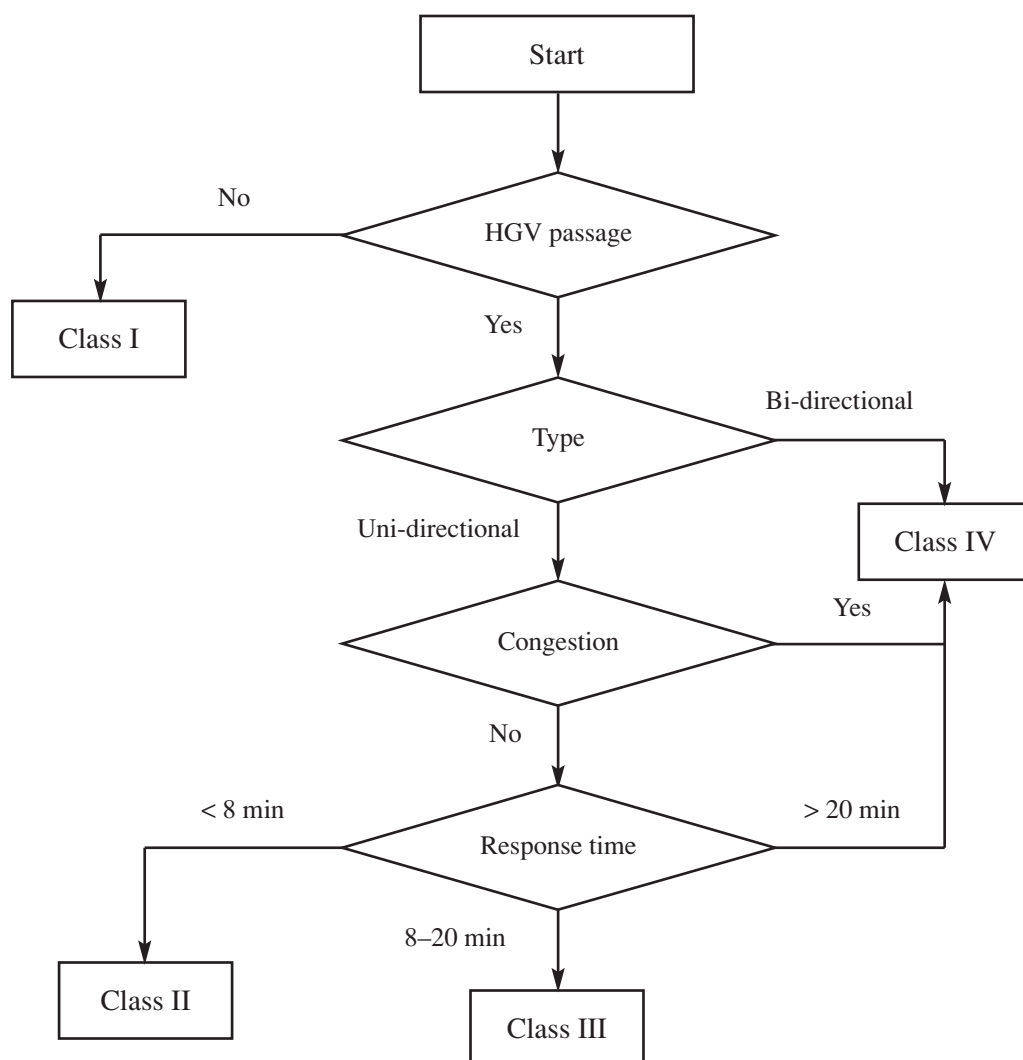


Super Vacuum Manufacturing Co., Inc. • P.O. Box 87 • Loveland, CO 80539 USA

www.supervac.com

Tel: +970 667 5146

Flow chart for
classification models of
road tunnels



has been put into a flow chart, which indicates the basics of the classification system.

Briefly, the classes are as follows:

Class I: The passage of HGV and flammable vehicles carrying dangerous goods is restricted. In terms of fire spread, there is little risk. The tunnels are regarded as the safest tunnels.

Class II: The uni-directional tunnels that are within eight minutes of the fire stations or where fixed fire suppression systems, such as sprinkler are installed. All types of fires may be brought under control either by the fire brigades or fixed fire suppression systems.

Class III: The uni-directional tunnels. The Fire brigade may be able to extinguish slow-developed fires.

Class IV: Tunnels that are congested or bi-directional. The possibilities of single fire or collision fires and fire spreads are expected to be significantly high.

As can be seen from the description, the choice of class depends on the type of traffic (large vehicles, types of loads, queue formation), the

type of tunnel (uni-directional or bi-directional traffic), the physical equipment installed in the tunnel (sprinklers and ventilation), the time taken for the fire and rescue services to reach the site, possible accident scenarios and fire scenarios. All these factors are considered in order to decide the class to which the tunnel belongs.

The lowest risk class presupposes that the fire and rescue services are capable of tackling all types of fires. Installation of a sprinkler system can affect the class rating of the tunnel. Tunnel owners and fire and rescue services can use the classification system in their discussions to select appropriate physical safety systems and to make assessments concerning the necessary response times and strategies.

In conclusion

It should be noted that the study has focused on fire and rescue services and outlines the potential risk levels that each road tunnel may have. The study may assist fire authorities or stakeholders to develop countermeasures to compensate for any potential danger. It is hoped that more advanced parameters can be developed that represent the contribution of the fire and rescue work to the risk evaluation, and that they are included into the future risk analysis process.

Professor Haukur Ingason
is at SP Technical Research
Institute of Sweden,
Department of Fire
Technology

Authors to the SP report
entitled: *Effective Firefighting
Operations in Road Tunnels
2010:10*, were Hak Kuen Kim,
of the South, Anders
Lönnermark fire and rescue
services in and Haukur
Ingason

For more information go to
www.sp.se

Making firefighting **safer!**



PAB Personal Protective Equipment

firefight series

Made of
composite fiberglass

FIRE HT 04 Composite

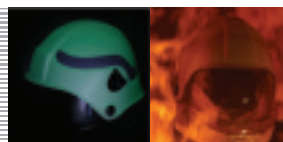
We are introducing the firefighter helmet of tomorrow. It is designed to protect the head in the most extreme conditions. Development and implementation of new composite technology in combination with established design enable full protection even at shorter (flash over flames) temperature exposures, reaching up to 1000 °C. These advantages are rounded up with extreme lightweight (1.200 g) and such design that supports a wide selection of compatible accessories. Structural firefighting has never been safer.



PAB Personal Protective Equipment
Most 26, 52420 Buzet – Croatia

tel: +385 52 662 662
fax: +385 52 662 254

info@pab-buzet.com
www.pab-buzet.com



ONLY FIRETRACE IS FIRETRACE

OTHER TUBE-BASED SYSTEMS
CLAIM TO BE LIKE FIRETRACE.
THEY ARE NOT.

- + Only FIRETRACE INTERNATIONAL Systems offer the extensively tested Firetrace brand solutions with listings and approvals[†] from CE, FM, UL, ULC and more than 25 other international agencies on agents such as Dupont FM-200, 3M Novec 1230, CO₂, and ABC dry chemical.[†]
- + Only FIRETRACE INTERNATIONAL has 20 years of experience with more than 65,000 systems protecting equipment worldwide.
- + Only Genuine FIRETRACE SYSTEMS have the tested and proven reliability you and your customers require.

Never compromise your reputation by using impostor, untested and unapproved systems – be sure you are using genuine Firetrace.

FIRETRACE®
AUTOMATIC FIRE SUPPRESSION SYSTEMS

Call +44 (0) 1293 780390 (Europe, Middle East, Africa) or
+1 480 607 1218 (US and elsewhere) or e-mail info@firetrace.com
to see why Firetrace is the right solution for your fire protection needs.

www.firetrace.com
www.firetrace.eu



Firetrace® is a registered trademark of Firetrace USA, LLC / Firetrace Ltd. All unauthorized uses of the Firetrace trademark shall be prosecuted to the fullest extent permitted by the law.

[†] Listings and Approvals vary by system and agent.

**INSIST ON GENUINE
FIRETRACE SYSTEMS
FOR PROVEN FIRE
SUPPRESSION**





By Scott Starr

Firetrace International

Protect What Really Counts

You do not have to lose the entire building to fire to destroy a business, losing just the business critical assets is enough to do that. So, think “business critical” first when making detection and suppression decisions.

There is little doubt that, where sophisticated facility-wide fire detection and alarm systems have been installed that are appropriate to the facility being protected, the result has invariably been faster response, speedier firefighting, reduced collateral damage and fewer casualties.

While these outcomes are wholly commendable, they may have little or nothing to do with the affected businesses ability to continue trading at full capacity. After all, the primary concern of the owner or operator of any asset is whether the business can continue to operate after a fire. In this context, what may be far more important is precisely what has been destroyed rather than how much of the facility has been damaged.

Consider a couple of examples. A major fire at a manufacturing facility may destroy raw materials or damage finished inventory, but these may be relatively quickly replenished, compared with the loss of production machinery that may take many

months to replace. Conversely, a comparatively minor fire involving telecom equipment in a bank or insurance company's call centre can cost the organisation millions of dollars in a very short space of time.

Thinking this way is something of a change of mindset that, in part at least, has been brought about by more thought being given to fire strategy than was once the case. As more and more detection and alarm options came onto the market offering previously unavailable accuracy and reliability, “total” detection and alarm solutions grew in their appeal. Achieving blanket detection and alarm across a facility was seen as the ultimate protection; a belief that, understandably, those companies manufacturing and installing such systems were only too happy encourage.

Recently though many leading fire engineers have adopted a more strategic approach to fire safety; a move that was undoubtedly encouraged



by the growing number of buildings where the science of fire engineering has been used in place of prescriptive measures. This approach is risk assessment led and has brought about a much wider appreciation that, while some assets or parts of a building may present no greater fire risk than other areas, the business continuity implications of their loss or damage demands that they are given closer and greater attention.

The total coverage myth

Advocates of total facility-wide solutions argue, of course, that their systems cover all risks and areas, so are already protecting the business critical assets. Frequently this is simply not the case.

The reality is that the majority of business critical assets are, for one reason or another, housed in some form of micro-enclosure. This may be for security to stop accidental or malicious tampering, to provide an atmospherically controlled environment, to ensure protection from damage, to stop people coming into contact with the equipment and being injured, or merely because the asset needs to be "contained". This means that these assets are effectively denied the protection offered by facility-wide detection and, hence, any prospect of swift suppression.

It makes little difference what facility-wide detection system is used; the result will be much the same, whether it is conventional heat, smoke or flame detectors – including the latest combination sensors and detectors – beam detection, aspirating smoke detection or video smoke detection. The problem for all of these systems is that, by the time the required initiator of the alarm, be it smoke, flames or heat, has escaped from the enclosure and reached the sensor or the detector's line-of-sight, the asset within the enclosure will have already been seriously damaged or destroyed.

Two conclusions can reasonably be drawn from this. The first is that such assets require dedicated

protection that is positioned within the asset's enclosure. The second is that it is equally important that suppression is also housed in the enclosure.

What is a business critical asset?

What is considered to be a critical asset to one organisation may well be easily replaceable by another, or the asset in question may well be replicated elsewhere in the building or off site and "switch-over" may take only a matter of minutes or hours. So, the acid test is to ask the question: "Can the business continue to operate at an acceptable level if we lose this asset?". If the answer is "no", you have identified a business critical asset.

Of course, the terms "business critical" and "mission critical" are sometimes used as though they are one and the same thing. This is not always the case. An asset may be lost to fire that will not jeopardise the survival of the business, but it may seriously impair the organisation's ability to adhere to its mission statement and provide the level of service that customers have been promised or have come to expect. So, a second question that should be asked is: "Will the loss of this asset diminish the service our customers expect to receive?". If the answer is "yes", the asset is mission critical and, arguably, should be given the same dedicated protection as the organisation's business critical assets.

While a business critical register is organisation specific, the following list does indicate that few operations are without business critical assets of one form or another. This list is by no means exhaustive:

- Telecommunications and IT-based organisations – server cabinets.
- Heavy off-road equipment operators – engine and generator compartments.
- Bus and coach operators – engine and generator compartments.

- Railway companies – control and electrical panels and distribution equipment.
- Airport operators – electrical cabinets and enclosures.
- Manufacturing companies – CNC machines and electrical and control cabinets.
- Pharmaceutical manufacturers – fume hoods and hazardous material storage.
- Oil and gas operations – control and communications enclosures.
- Electricity, water and gas utilities – electrical control panels.
- Wind farm operators – electrical, control, and transmission enclosures.
- Research organisations – fume hoods and hazardous material storage.
- Process industries – machines and electrical control enclosures.
- Mining and extraction – pumps and electrical cabinets.

Selecting the right protection

The essential characteristics of an effective micro-enclosure fire detection and suppression system are that it should:

- 1 Deliver around-the-clock reliability and 24/7 unsupervised protection of the enclosure.
- 2 Combine detection and suppression in a single package.
- 3 Detect and suppress a fire with unerring reliability, precisely where it breaks out (within the enclosure) and before it takes hold or spreads.
- 4 Ensure an absence of false alarms.
- 5 Do no damage to the very asset it is installed to protect.
- 6 Be supplied with a suppression agent that is wholly appropriate to the fire risk and the asset being protected.

In many applications, the solution should also:

- 7 Contend with vibration, dust, debris and airflow.
- 8 Contend with extreme temperature variations.
- 9 Require no external power and be intrinsically safe.
- 10 Be capable of being retrofitted to existing assets.

The solution should also, of course, have a proven track record, comply with the appropriate international standards and be listed or approved by such independent accreditation organisations as UL (Underwriters Laboratories) and FM (Factory Mutual).

The devil is in the detail

Take a close look at this list of essential characteristics and it soon becomes apparent that few systems come close to meeting all of the requirements. The list also highlights areas where extra special care is necessary. Take, for example, the need for the suppression agent to be wholly appropriate to the fire risk and the asset being protected.

For many applications the appropriate choice is a clean suppression agent such as 3M™Novec™1230 Fire Protection Fluid that, when discharged, transmutes into a colourless and odourless gas. It has a negligible impact on the environment and has insignificant global warming potential. Significantly, it does not damage sensitive electronic, communications or IT equipment



and leaves no residue requiring clean-up after discharge.

However, although effective for a wide range of applications, Novec 1230 is not necessarily the most appropriate agent in every case. ABC dry chemical agents, CO₂ (carbon dioxide) and AFFF (Aqueous Film Forming Foam) concentrates are other widely used business critical asset application-specific suppression agents.

Integrated detection and suppression

This need to carefully select the right suppression agent, and satisfy the other nine characteristics listed earlier has led to one solution being used in more than 150,000 applications around the world. It is the only UL listed and FM approved linear pneumatic system in the world that is tested as an automatic fire detection and suppression system.

FIRETRACE® from Firetrace International is a self-contained system that requires neither electricity nor external power; a solution that is activated automatically around-the-clock without the need for manual activation or monitoring. It requires virtually no maintenance, and is an intrinsically safe solution as it does not contain any components that produce sparks or which can hold enough energy to produce a spark of sufficient energy to cause an ignition.

It comprises a cylinder that is valve-attached to proprietary Firetrace Detection Tubing; technically-advanced, leak-resistant polymer tubing that is a linear pneumatic heat and flame detector designed to deliver the desired temperature-sensitive detection and delivery characteristics.

The tubing is routed throughout the areas to be protected and, when exposed to heat and radiant energy from a fire, it ruptures and instantly directs the suppression agent at the source of the fire. The only thing that will rupture the tube is heat or flame from a fire, so there is no prospect of false alarms; yet, if a fire breaks out in the enclosure, the response is unerringly immediate and accurately targeted.

APF

Scott Starr is Director of Global Marketing at Firetrace International

For more information go to www.firetrace.com



ONE SIZE DOES NOT FIT ALL

You can't trust one detector model to meet all your fire detection needs. **But you can trust VESDA**, the world's leading air-sampling smoke detection (ASD) systems.

- ❖ VESDA ASDs come in a **variety of models** to provide very early warning smoke detection for a **broad range** of applications and environments of different sizes — from data centers to large, open spaces and even harsh environments.
- ❖ With more than **25 years of experience** and thousands of installations worldwide, the pioneer in ASD has you covered.
- ❖ And your decision is backed by **global approvals** for every product.

Xtralis,
the world's
leading supplier
of ASD

World Market for
Fire Detection and
Suppression Products
- 2010 Edition
by IMS Research



VESDA®
by  **xtralis**™

- ❖ To learn more about VESDA, visit us at www.xtralis.com/vesda or contact us at marketing-apac@xtralis.com.



The Growing Role Of Voice In Fire Safety

By Rick Love

Notifier by Honeywell

Research shows that more people respond to spoken message alarms than either alarm bells or text messages.

Some years ago, a survey found that, in the event of a fire, only 13 percent of people responded to a bell warning: by contrast, 45 percent reacted to a written text message display and some 75 percent to a spoken message.

The results of this earlier study may not perhaps be very surprising. However, as the latest research undertaken on behalf of Notifier has confirmed, the overwhelming majority of the general public and industry specialists alike believe that over the past five years the world around us has since become even noisier.

And this is especially worrying, as the new research also identified that fewer than ten percent of the general public always think about how to get out of a building, whether or not they use it regularly. In the event of a fire alarm, a common response is first to assume that it is a false alarm and then “follow other people around me” rather than adhere to the safety instructions.

Bells and sounders can only provide a warning that there is some kind of emergency, but it is not always obvious what kind of emergency it is. By contrast, a clear spoken message and a VAVPA system provide the information needed to direct the public or employees away from danger and out of the building in the most efficient way possible.

Fighting to be heard

The recent surveys, which enabled a comparison of the views of fire safety professionals attending a

Construction CPD seminar with those of the general public, found some interesting similarities in how each group would react in an emergency situation. The overwhelming majority of the public (86 percent) and industry specialists (74 percent) believe that the world is a noisier place than five years ago.

Yet this is taking some time to feed through to expectations regarding the provision of appropriate fire safety messaging. In the event of a fire alarm, 89 percent of the public, and 77 percent of industry experts expect to hear a bell or other audible sounder, with only 12 percent and 20 percent respectively anticipating a standard or more detailed kind of loudspeaker announcement. Yet well over half (57 percent) of the public are already certain that they would respond more quickly to a voice alarm in evacuating a building, with a further 32 percent as yet not sure how they would react.

This lack of directional information is critical, as only six percent of the public always think about how to get out a building in an emergency in which they are regular occupants and only three percent in those buildings where they are occasional visitors. Equally worryingly, two-thirds rarely, if at all, think about evacuation procedures as regular occupants. This rises to almost 90 percent in buildings they use infrequently.

Although professionally more aware of the risks, more than 40 per cent of industry experts also rarely or never think about how to get out



of any building, whether or not they use such facilities regularly.

In the event of a fire alarm, 40 percent of the public (and 26 percent of industry experts) would instinctively follow the people around them and only 29 percent would use the nearest exit. In the case of both the public and industry experts, more than one quarter (26 percent) would assume it is a false alarm until advised otherwise.

As a result, it has become more important than ever to ensure that staff, residents and visitors alike are able to respond quickly and correctly to a fire warning. In response, sophisticated and intuitive voice alarm systems have evolved to form a key part of comprehensive fire detection and

alarm systems, designed for complex environments in which individuals will respond to warnings in different ways.

These integrated solutions benefit both building users and firefighters called to deal with the emergency, as they are able easily to take over the Voice Alarm/Public Address (VA/PA) system to broadcast individualised messages, in order to ensure a rapid yet controlled evacuation from any part of the premises at risk.

An integrated response

In the 1980s, early voice alarm systems in the UK and Europe were typically message generators bolted onto an existing PA system, with a simple trigger mechanism from the fire alarm to play a pre-set message over the loudspeakers.

However, over the past two decades its capability has been extended, replacing earlier sounder circuits with the development of an integrated and monitored VA/PA approach. This enables messaging such as paging, information announcements, advertisements and the provision of background music in public access areas such as shopping centres, railway stations and sports stadia. It maximises the value of their investment and provides customers and visitors with a more comprehensive service and in the safest possible environment.

Technical developments, especially in the area of digital signal processing, have made it much easier to manage VA/PA systems. PC-controlled site-configurable routing and set-ups have replaced the costly and high-maintenance hard wiring and relays previously required and the resulting audio quality is also much improved.

Today's advanced VA/PA solutions are much more cost-effective in that they require fewer amplifiers. They are much easier for operators to use, as the microphone stations use the latest LCD-type screen technology to direct and control announcements. For larger implementations, the



best network systems can carry up to 32 audio channels on a fibre channel interface up to two kilometres between stations. This means that a single integrated VA/PA system managing multiple channels of music, general announcements and fire safety information makes it easy to manage large multi-purpose premises and public arenas.

Continuous development

With the emergence of voice over IP (VoIP) networks, work is also underway to enhance the ability to link multiple buildings together across large sites in an integrated, cost effective and easy-to-use VA/PA solution. This forms part of a broader drive towards greater networkability, designed to improve system implementation and maintenance and ensure greater security in linking locations with a single integrated solution.

However, an area of historic concern that is receiving much attention is that of intelligibility, as there is no point in having a VA/PA system in which messages being transmitted cannot be understood. The reason for this problem is that the sound that is sent from a traditional speaker is essentially undirected. As a result, it bounces off the floor, walls and is reflected off other surfaces, each of which reaches the ear at slightly different times, so leading to aural confusion.

The life safety industry continues to place a high development priority on the addition of voice to its armoury of fire detection and response solutions.

Speaker technology has remained essentially unchanged for many decades. However, “intelligent” speakers are now available to meet specialist applications such as large facilities with acoustic problems, including noisy railway stations or swimming pools. The intelligent line array speaker, for example, is a tall column which splits the sound beam in three different lobes. From a single speaker therefore, it has become possible to direct the sound where required with real precision. Such solutions are also cost-effective. For though an individual line array speaker is more expensive, fewer are required within an installation due to their more targeted performance. This also impacts positively on the cost of installation and on-going maintenance.

Regulatory changes

One area of fire safety regulation likely to be subject to change in the near future is that of visual alarm devices under EN54 Part 23, anticipated to come into effect in the next two to three years. As with the UK's Equality Act, October 2010, the driver here is to protect those who cannot hear a sounder or alarm or who work in areas where there are significant ambient noise levels such as workshops or manufacturing environments.

In line with the current US standards – which, for example, require lights in a hotel environment to be bright enough to wake people from a light sleep – the impending regulation will determine



how bright visual devices should be. This presents a major technical challenge in getting sufficient power to the device and may promote a change of thinking. Instead of looking simply at improvements to the light or sound-based warning device, with improvements in wireless technology, an alternative may lie in the direction of personal alarm devices such as pager or vibrator solutions.

Other compliance demands

Though awareness as to the importance of voice is growing, the uptake of such products is still relatively slow. VA/PA solutions are principally used only as directed by the fire authority, or where the provision of a PA system to meet other needs makes the incremental cost significantly lower than where a simple upgrade from sounders is being considered.

Having said that, though budgets may be under extreme pressure, compliance demands have increased in requiring safe and environmentally-friendly public venues. As a result, almost without exception today in buildings requiring phased evacuation, any fire safety solution is likely to include an element of voice as part of a comprehensive detection and response strategy.

And, as the Notifier survey confirmed, most of the public are certain that they would respond more quickly to a voice alarm in evacuating a building, so endorsing the effectiveness of this approach to enabling faster, safer evacuation.

On a day-to-day basis, the latest VA/PA solutions operate just like an advanced PA system. Individual microphones with touch screen displays allow the broadcasting of background music and announcements. However, in an emergency the system will react, delivering spoken messages appropriate to the event and the occupants of each location within the premises. For situations that demand more specific responses, an emergency microphone can be controlled simply and easily.

The life safety industry continues to place a high development priority on the addition of voice to its armoury of fire detection and response solutions. As a result, from a technology viewpoint this is no longer a mysterious “dark art”, as cost-effective VA/PA solutions are now available which enhance the user experience, in providing a wide range of safety and other information messages.

APF

Rick Love is Senior Product Manager, Notifier by Honeywell

For more information go to www.notifier.com

Danger Made Visib

Cameras that combine thermal and video images can identify otherwise invisible sources of danger



A truck with a defective engine, faulty brakes, or hazardous freight can trigger an inferno in a tunnel. Siemens researchers are investigating how to use RFID technology, video analysis, and thermal imaging cameras to spot vehicles that are at risk.

By Rolf Sterbak

Siemens

The driver of the tanker truck does not know that he is heading for disaster. He is unaware that the braking system on one of his rear wheels is blocking and beginning to glow red hot. There is a tunnel coming – in three kilometres – but the potential catastrophe does not have a chance to unfold thanks to newly developed safety systems that have already detected the rolling time-bomb and triggered an alarm in the tunnel operator's control centre. Here, staff switch the lights at the tunnel entrance to red, and flashing hazard signs redirect the driver in order to defuse the dangerous situation.

This scenario is still a future vision. Nevertheless, a research project known as SKRIBT – a German acronym for Protection of Critical Bridges and Tunnels on Roads – which is being conducted by scientists at Siemens Corporate Technology (CT) and its Mobility Division, is moving closer to making this vision a reality.

Ten partners from government agencies, industry and research institutes are participating in a three-year project, which is being funded by the German Ministry of Education and Research. The aim is to make critical road segments safer. "Tunnels and bridges are the most important components of the road network," says Dr. Frank Heimbecher, project coordinator at Germany's Federal Highway Research Institute, which initiated the SKRIBT project. "If they get damaged, the consequences can be economically devastating."

Most major accidents in tunnels involve defective trucks in which tires blow, brakes overheat, or engines fail in a manner that triggers a fire. That is why Alla Heidenreich, infrastructure project manager at Siemens CT, has been working with her team since 2008 on two safety systems that can identify defective trucks and those transporting hazardous materials, before they enter a tunnel.

The researchers, who are from Munich and Princeton, New Jersey, USA, came up with the idea of combining video images with thermal imaging technology. This enables them to determine if certain vehicle components are overheating. The system works as follows. A video processing program linked to surveillance cameras identifies a passing truck and converts a segmented two-dimensional image of it into a 3D model using newly-developed algorithms. The program is then able to recognise components that are susceptible to fire, such as wheels, brakes and axles.

The thermal image of the truck, which is recorded using an infrared camera, is linked with the 3D image, after which an analysis program searches for anomalies that could indicate defects. It does this using knowledge gained from models that provide information on things such as how hot one axle may get in relation to the others. Because normal video cameras need expensive external lighting at night, Siemens researchers are working on another idea. "Our next step will be to study possibilities for the exclusive use of infrared

le



images to identify potentially dangerous situations with tires, brakes, and axles," says Dr. Andreas Hutter, an expert in real-time image processing. "If we succeed, we will be able to significantly reduce costs."

Hazardous material transportation poses an even greater problem, especially if it is not clear what type of cargo is being shipped. Some materials, such as gasoline, may be transported by truck only through certain tunnels. Up until now, there has been no automated system for monitoring compliance with such rules. Trucks today are in fact required to carry orange stickers bearing coded information on how dangerous their freight is and which categories of tunnels they may pass through. However, video cameras can not decipher these labels when visibility is poor or the labels are covered with dirt. Radio Frequency Identification (RFID) transponders would thus offer a major benefit.

Transmission-enabled stickers

If experts at CT have their way, trucks will soon also be equipped with hazardous material labels containing a small RFID chip that can be read via radio, and that also holds all information about what the truck is carrying. "That would significantly increase the accuracy of the monitoring system," says Heidenreich.

Such a system would function roughly as follows. When a truck passes a reading point approximately three kilometres before a tunnel, its cargo data would be registered by the RFID system and forwarded to a control centre. Only one truck transporting hazardous materials would be permitted in the tunnel at a time. Should an accident occur, firefighters would tackle the blaze using precisely the right extinguishing agent. Any truck attempting to enter a tunnel with prohibited freight would be stopped by a red light in front of the entrance.

The CT team is particularly proud of its newly developed RFID transponder system's ability to meet extremely high demands. The chip can transmit its signal to the unit's reading device over a distance of around 50 metres and send the data at least twice within two seconds.

"Conventional passive radio chips without a built-in energy source have a range of only six meters," says Daniel Evers, an RFID expert at CT. "That is why we use an active chip that has a built-in battery and transmits in the high-frequency range of 2.45 GHz. To ensure the battery lasts as long as possible, the transmitter in the transponder sleeps until it is woken by a radio pulse issued by the reading device at the checkpoint."

Evers also points out that the RFID data cannot be intercepted or falsified. To ensure this is the case, Siemens researchers employ an encryption technique they previously developed for passive RFID chips. "Previous solutions needed too much energy," says Hermann Seuschek, an IT security expert at CT. "However, our cryptochip is so energy efficient that the transponder can run for at least three years without needing a replacement battery."

Research activities are being followed by road tests where Siemens' researchers installed truck detection system components at the Aubinger Tunnel near Munich. Plans call for the tunnel safety system to be tested until February 2011. "Up until now, activities have focused on improving safety within the tunnel," says Heidenreich. "But in the future, we are going to be able to detect and prevent danger before a vehicle gets there. Video, RFID, and infrared technologies will play a key role in this process."

APF

This article first appeared in the Spring 2010 edition of *Pictures of the Future*, Siemens' magazine for research and innovation.

For more information go to
www.siemens.com/innovation

White-Water Rescue Right Gear



By **Cody Harris**

Whitewater Rescue
Institute



Swiftwater poses many dangers to the rescuer. It is a dynamic environment where one small mistake or misjudgement can snowball into catastrophe.

In past years, a third of drowning victims in the United States were would-be rescuers, many of whom lacked either proper training or equipment. So, it is of paramount importance for rescue teams to not only purchase the proper equipment, but also to train and practice in swiftwater.

NFPA (National Fire Protection Association) standard 1670 (Standard on operations and training for technical search and rescue incidents) outlines three levels of training for swiftwater rescue: awareness; operations; and technician. So, before purchasing any equipment, your agency should decide which level of training you will pursue, as there is a different equipment list for each.

Equipment lists

The awareness level of training is designed for agencies and rescuers who have a minimal exposure to swiftwater. Typically, the requirements to reach this level of training are an eight-hour course. Awareness level rescuers will not be entering the water, but may be operating in proximity to the water.

The minimum equipment requirement is:

- Helmet.
- Personal Flotation Device (PFD).

- Proper Footwear.
- Throw-bag.

The operations level of training is designed for agencies and rescuers who will be assisting in-water rescues and could be exposed to accidental swims. Typically, the requirements to reach this level of training are a 16-hour course.

The minimum equipment requirement is:

- Helmet.
- PFD.
- Thermal Protection.
- Proper Footwear.
- Throw-bag.

The technician level of training is designed for agencies and rescuers who will be conducting in-water rescues, either swimming or by boat. Typically, the requirements to reach this level of training are a 24-hour swiftwater course and 24-hour technical ropes course.

The minimum equipment requirement is:

- Helmet.
- PFD.
- Thermal Protection.
- Gloves.
- Proper Footwear.
- Throw-bag.

ue – Getting The

Making the right equipment choices

Helmets:

There are many manufacturers of water sports helmets, each with their own strengths and weaknesses. The most important factor when deciding on a helmet is comfort. An uncomfortable helmet will usually end up unbuckled or taken off. Either way, it will not be doing its job.

After comfort, the helmet should be assessed for coverage. There is an assortment of styles, from full-face to over-the-ears. One of the most important areas of coverage is the forehead, and many helmets will slide back, leaving the forehead exposed. This is not acceptable in white-water.

The final consideration for helmets should be whether or not a skull cap or beanie will fit underneath it. In many countries, rescues occur during spring run-off, when the water is between one degree C and four degrees C, so extra warmth is a necessity during these rescues. Many helmets allow you to easily adjust the padding inside to accommodate this.

Personal Flotation Devices:

The U.S. Coast Guard has developed standards for PFDs. It is essential that the PFD chosen is designed for white-water use and is a Type III or V, which will generally provide more flotation. The PFD should fit comfortably on the rescuer and should be snug when adjusted. The typical way of testing this is by pulling the shoulder straps up; if the PFD pulls up the torso and covers the rescuer's chin, then it should be tightened.

A Swiftwater Rescue technician should consider purchasing a rescue PFD. These PFDs come with a quick release harness, allowing the rescuer to perform a tethered swim. However, caution is needed. Tethered swims require training to perform so, if your agency does not have a technician-level rescuer, avoid the purchase of a rescue PFD. This will prevent the misuse of the harness.

All PFDs should have a whistle and knife attached to them, and beware of purchasing a PFD with too many pockets. Although they can be convenient during rescue operations, they can often become a nuisance or entrapment hazard in the water.

Thermal protection:

There are really only two choices here: wetsuit or drysuit.

The benefits of wetsuits are that they are:

- Relatively inexpensive.
- Provide abrasion and impact protection.
- Provide warmth in the water.
- Relatively comfortable.
- Durable.

The weaknesses are that they:

- Do not provide significant warmth out of the water.
- Can be restrictive and increase difficulty with swimming.

The benefits of drysuits are that they:

- Provide maximum warmth in and out of water.
- Are non-restrictive when swimming.
- Provide body substance isolation.
- Provide entire body coverage, with the exception of hands and head.

The weaknesses are that:

- They are expensive.
- Latex gaskets around neck and wrists can be uncomfortable.
- They offer no impact or abrasion protection.
- They can tear and become ineffective in water.

For rescue teams functioning in cold water, the decision is fairly simple. Drysuits provide the maximum amount of thermal protection.

Gloves:

Simple neoprene gloves will protect hands from rope burns and provide warmth. Avoid other materials.

Footwear:

Footwear is the most overlooked, and perhaps most important part of the swiftwater gear. Most injuries on the river occur, not in the water, but on loose, jagged rocks on shore. So, proper footwear should be worn by all members of the rescue team.

There are numerous options for river shoes, most of which are constructed from neoprene. Rescuers must balance foot protection with flexibility for swimming; large lace-up water rescue boots are great for walking and working on shore, but can be difficult when swimming. Thin neoprene booties are great for swimming, but provide little protection for walking.

If swimming fins are a consideration for the rescue team, then assure that the river shoes fit inside the fins.

Throw-bags:

Throw-bags come in varying shapes and sizes, and are made of many different materials.

The minimum length for a rescue team should be between 15 metres and 18 metres of rope. Consider purchasing a more expensive low-stretch rope, such as spectra or dyneema as this will allow the rescuer to use the rope as a tensioning tool if necessary. Technician-level rescuers should consider a belt-bag that fits around the waist, allowing the rescuer to swim while transporting the bag.

Final thoughts

When it comes to swiftwater gear there is a lot of choice. However, it is important that each agency and individual assess carefully the use to which the gear may potentially be put, and choose accordingly. Keep in mind, though, that even the best, most expensive gear is only as good as the rescuer using it. Swiftwater rescue requires training and practice.

APF

Cody Harris is the Director of the Whitewater Rescue Institute

For more information go to www.whitewaterrescue.com

Distributor and Representative Offices

BAUER COMPRESSORS

AUSTRALIA

BAUER KOMPRESSOREN AUSTRALIA PTY LTD

2/35 Hallstrom Place
Wetherill Park
Sydney, NSW 2164 Australia
Tel: +61 (0)2 9756 2700
Fax: +61 (0)2 9756 1700
Email: enquiries@bauer-kompressoren.com.au
Bauer Subsidiary Office

BANGLADESH

BIZ2SAFE ENTERPRISE PTE LTD

192/1 East Kafrul
Dhaka Cantonment
Dhaka 1206, Bangladesh
Contact: Mr Gupta
Tel: 88 0 2 875 0010 or 9198 202 98969
Fax: 88 0 2 871 4400
Email: biz2save@gmail.com
Dealer/Distributor

BRUNEI

BAUER COMPRESSORS ASIA PTE LTD

2 Penjuru Place
#01-05 Penjuru Tech Hub
Singapore 608783
Contact: Mr Russell Parton (Managing Director)
Tel: +65 6271 6271
Fax: +65 6272 3345
Email: info@bauer-compressors.com.sg
Bauer Subsidiary Office

CHINA

BAUER KOMPRESSOREN SHANGHAI LTD

878 Jianchuan Road
Minhang, Shanghai
China 200240
Tel: +86 21 5471 3598
Fax: +86 21 5471 3818
Email: sales.sh@bauerchina.com
Bauer Subsidiary Office

FRENCH POLYNESIA

TAHITI SPORT

PO Box 62, 98713 Papeete
Tahiti, French Polynesia
Contact: Mr Thierry Alberola
Tel: +689 505959
Fax: +689 421775
Email: plongee@tahiti-sport.pf
Dealer/Distributor

HONG KONG

BAUER KOMPRESSOREN CHINA LTD

707 Block A, M.P. Industrial Centre
18 Ka Yip Street
Chaiwan, Hong Kong
Tel: +852 2595 1898
Fax: +852 2595 0878
Email: bkc@bauerchina.com
Bauer Subsidiary Office

INDIA

BAUER KOMPRESSOREN INDIA PVT LTD

A 71/72, H Block, MIDC Pimpri
Pune – 411 018, India
Tel: +91 20 67308100 to 7
Fax: +91 20 27487000
Email: info@bauer-kompressoren.in
Bauer Subsidiary Office

INDONESIA

DIVEMASTERS INDONESIA

Jalan Bangka Raya
No. 39A Pela Mampang
Jakarta 12720, Indonesia
Tel: 62-21 719 9045
Fax: 62-21 719 8974
Email: sales@divemasters.co.id
Website: www.divemasters.co.id
Dealer/Distributor

KOREA

TECKO CO LTD

2F, SK@Technopark, Mega-Dong
190-1 Sangdaewon-Dong
Sungnam-City
Kyungki-Do 462 807, Korea
Contact: Mr K Y Lee
Tel: +82 31 776 2442
Fax: +82 31 776 2444
Email: kylee@tecko.co.kr
Dealer/Distributor

MALAYSIA

SK CRYOGENICS SDN BHD

No. 16 Jalan Anngerik Mokara 31/52
Section 31, Kota Kemuning
40460 Shah Alam, Selangor, Malaysia
Contact: Mr Steve Kellett
Tel: +60 3 5122 4269
Fax: +60 3 5122 4235
Email: steve@skcryogenics.com
Dealer/Distributor

PAKISTAN

ALPINE INDUSTRIALCON PVT LTD

305/2 G.T. Road
Baghbanpura
Lahore, Pakistan
Contact: Mr Kashif Ahmad
Tel: +92 42 685 2313
Fax: +92 42 655 3674
Email: alpinelaware@hotmail.com
Dealer/Distributor

PHILIPPINES

CEBU ERNBRI IMPORT INC/ AQUAVENTURE WHITETIP DIVE SUPPLY

Ermita Office: Unit 101 Joncor II Bldg
#1362 A. Mabini Street
Ermita Manila Philippines 1000, Philippines
Contact: Mr Brian L Giles
Tel: +632 521 0433
Fax: +632 522 1165
Email: brian@aquaventurewhitetip.com
Dealer/Distributor

SINGAPORE

BAUER COMPRESSORS ASIA PTE LTD

2 Penjuru Place
#01-05 Penjuru Tech Hub
Singapore 608783
Contact: Mr Stephen Hines (Managing Director)
Tel: +65 6271 6271
Fax: +65 6272 3345
Email: info@bauer-compressors.com.sg
Bauer Subsidiary Office

MARINE & INDUSTRIAL COMPRESSORS

304 Thomson Road
Singapore 307654
Contact: Mr C H Sng
Tel: +65 6250 6018
Fax: +65 6253 8443
Email: masmarin@singnet.com.sg
Dealer/Distributor

SRI LANKA

HALCHEM LANKA PVT LTD

No 7, Siri Dhamma Mawatha
Colombo 10
Sri Lanka
Contact: Mr Cyril Halloluwa Managing Director
Tel: +94 11 5843213 and 5843219 (Direct)
Fax: +94 11 2674 615 and 2792 406
Email: cyril.halloluwa@halchem-lanka.com
Website: www.halchem-lanka.com
Dealer/Distributor

TAIWAN

MING SHEN ENTERPRISE CO LTD

5, PaShih 1 Street, DanShui Town
Taipei, Taiwan 25170
Taiwan
Contact: Mr Tom Tseng
Tel: +886 (2) 2809 5789
Fax: +886 (2) 2809 6189
Email: tom@3arrow.com.tw
Dealer/Distributor

THAILAND

DIVE SUPPLY CO LTD

88/5 Patak Rd, Chalong Bay
Phuket 83130. Thailand
Tel: +66 (76) 383414
Fax: +66 (76) 281525
Email: gm@divesupply.com
Dealer/Distributor

INTER SOL ENGINEERING & TECHNOLOGY PTE LTD

7/288 Moo 6, Chaengwattana Road
Bhanmai, Pakkred, Nonthaburi 11120
Thailand
Contact: Mr Nathanan
Tel: +66 2 9808754
Fax: +66 2 9808753
Email: nathanan@intersol.th.com
Dealer/Distributor

VIETNAM

FRANCO-PACIFIC VIETNAM CO LTD

55 Ho Hao Hon Street
District 1, Ho Chi Minh City, Vietnam
Contact: Mr Colm Minogue
Tel: +84 8 836 0257
Fax: +84 8 836 1387
Email: colmminogue@francopacific.com
Dealer/Distributor

BLÜCHER GMBH

SINGAPORE

Contact: Mr Raymond Hoi
Account Manager Blücher Office
Singapore
Cell: +65 903 06972
Email: raymond@bluechersg.com
Website: www.bluecher.com
Representative Office

BRISTOL UNIFORMS

AUSTRALIA

PAC FIRE AUSTRALIA (formerly Pacific Helmets Australia)

Unit 1, 28 Burnside Road
Hallmarc Business Park
Yatala Qld 4207, Australia
Tel: +61 7 3441 7100
Fax: +61 7 3441 7177
Email: sales@pacfire.com.au
Website: www.pacfire.com.au
Dealer/Distributor

BANGLADESH

MANIK BROTHERS

Hai Mansion (3rd Floor)
9/3 Motijheel Circular Road
Dhaka – 1000
Bangladesh
Contact: Mr A K Bhowmick
Tel: +880 2 7100 589
Fax: +880 2 7100 386
Email: manikbros@1postbox.com
Dealer/Distributor

BRUNEI

DASAPREM

10 & 12 Jalan Muara 8/9
40000 Shah Alam
Selangor, Darul Ehsan
Malaysia
Contact: Mr Prem R Murthy
Tel: +603 550 9060
Fax: +603 550 4486
Email: dasaprem@yahoo.com
Website: www.dasaprem.com
Dealer/Distributor

YEN LEE FIREWELD PTE LTD

18 Penhas Road, 208182
Singapore
Tel: +65 62909890
Fax: +65 62961444
Email: jeffrey@fireweld.com.sg
Dealer/Distributor

CHINA**SHENZHEN RUFN INDUSTRIAL CO LTD**

RM-701, 7/F Leaser Tower
1st Fuhua Rd, Shenzhen, China
Contact: Amy Jin
Tel: +86 755 8399 9581
Fax: +86 755 8399 9548
Email: wj@rnf88.com

Dealer/Distributor**FIJI****PHILLIPS & SMITH LTD**

10 Akatea Road, Glendene
Auckland, New Zealand
Contact: Mr S Hampton
Tel: +649 818 8048
Fax: +649 818 4484
Email: stuart@firemaster.co.nz
Website: www.firemaster.co.nz

Dealer/Distributor**HONG KONG****CHUBB HONG KONG LTD**

3 Hok Yuen Street East
Hung Hom, Kowloon
Hong Kong
Contact: Mr Simon Tsang
Tel: +852 2746 9628
Fax: +852 2785 0849
Email: simonsft.chubb.com.hk
Website: www.chubb.com.hk

Dealer/Distributor**INDIA****FOREMOST MARKETING PVT LTD**

M-1 Green Park Extn,
New Delhi 110016 India
Contact: Mr Vinay Khanna
Tel: +91 11 261 969 82
Fax: +91 11 261 669 61
Email: foremost@vsnl.net
Website: www.foremostsafety.com

Dealer/Distributor**JAPAN****ABLE-YAMAUCHI CO LTD**

Yokohama Nishiguchi
SIA Building
10-36 Kitasaiwai
2-Chome Nishi-Ku
Yokohama 220-0004
Japan
Contact: S Yamauchi
Tel: +81 45 312 1130
Fax: +81 45 312 1350
Email: emiko@able-yamauchi.co.jp
Website: www.able.yamauchi.co.jp

Dealer/Distributor**MALAYSIA****DASAPREM (M) SDN BHD**

10 & 12 Jalan Muara 8/9
40000 Shah Alam
Selangor Darul Ehsan
Malaysia
Contact: Mr Prem R Murthy
Tel: +603 550 9060
Fax: +603 550 4486
Email: dasaprem@yahoo.com
Website: www.dasaprem.com

Dealer/Distributor**YEN LEE FIREWELD PTE LTD**

18 Penhas Road, 208182
Singapore
Tel: +65 62909890
Fax: +65 62961444
Email: jeffrey@fireweld.com.sg

Dealer/Distributor**NEW ZEALAND****PHILLIPS & SMITH LTD**

10 Akatea Road
Glendene
Auckland
New Zealand
Contact: Mr S Hampton
Tel: +649 818 8048
Fax: +649 818 4484
Email: stuart@firemaster.co.nz
Website: www.firemaster.co.nz

Dealer/Distributor**SINGAPORE****YEN LEE FIREWELD PTE LTD**

18 Penhas Road, 208182, Singapore
Tel: +65 62909890
Fax: +65 62961444
Email: jeffrey@fireweld.com.sg
Website: www.fireweld.com.sg

Dealer/Distributor**SRI LANKA****FIRETECH (PRIVATE) LTD**

34 Walter Gunesekara Mawatha
Nawala, Sri Lanka
Contact: Leon Daniels
Tel: +94 11 4410588
Fax: +94 11 2806666
Email: firetech@pan.lk

Dealer/Distributor**TAIWAN****SHENG-TAI FIRE PROTECTION INDUSTRIAL CO LTD**

No 222-2 Sec2, Cheng Tai Rd, Wu-Ku Shiang
Taipei, Hsien, Taiwan
Contact: Liu Yuan Hung
Tel: +886 22292 1751
Fax: +886 22291 1984
Email: sato@mail.mold.net.tw
Website: www.shengtai.com.tw

Dealer/Distributor**VIETNAM****TRAN VU TRADING CO LTD**

61 Ban Co Street, District 3, Hochiminh City, Viet Nam
Contact: Tran Vu Hong
Tel: +84 88325101
Fax: +84 88309586
Email: sales@tranvufire.com
Website: www.tranvufire.com

Dealer/Distributor**COLTRI ASIA PACIFIC****CHINA****SHANGHAI AND SOUTHERN CHINA:****SHANGHAI PANNY TRADING CO LTD**

3F, #17-2 No.230, Xinqiniao Rd.
Pudong new area, Shanghai China
Contact: Mr Todd
Tel: +86-21-50321062
Fax: +86-21-50321063
Email: panny-ye@hotmail.com
Website: www.coltrisub-china.com

Dealer/Distributor**HONG KONG AND MACAU****WAH SHING COMPANY**

No. 2B-2C, G/F, Larch Street
Tai Kok Tsui, Kowloon, Hong Kong SAR
Contact: Miss Jackio Kwok
Tel: +852 2391 3997, +852 2391 4084
Fax: +852 2789 4638
Email: wahshingcompany@gmail.com

Dealer/Distributor**INDIA****JYO TECH ENGINEERING & MARKETING**

H-49 A, Kalkaji, New Delhi 110019 India
Tel: +91 (11) 26447966
Fax: +91 (11) 26482189
Email: jyotech@del3.vsnl.net.in

Dealer/Distributor**INDONESIA****DIVEMASTERS INDONESIA JAKARTA**

Jl. Bangka Raya No.39A Jakarta 12720 Indonesia
Tel: +6221 7199045
Fax: +6221 7198974

Dealer/Distributor**BALI**

Jl. By Pass I Gusti Ngurah Rai No. 314 Sanur,
Denpasar 80228 Bali, Indonesia
Tel: +62361 283138
Fax: +62361 285736
Email: sales@divemasters.co.id

Dealer/Distributor**LAUTAN MAS**

Jl. Toko Tiga No. 24 Jakarta 11230 Indonesia
Tel: +62 (0) 21 690-1333
Fax: +62 (0) 21 690 2479
Email: info@lautanmas.com
Website: www.lautanmas.com

Dealer/Distributor**MALAYSIA****RAINBOW RUNNER S/B**

383D Jln Ampang 50450, Kuala Lumpur Malaysia
Tel: +60 (03) 42514368 or 42515368
Fax: +60 (03) 42511268
Branch: 3.06, Plaza Berjaya Jln Imbi
55100 Kuala Lumpur Malaysia
Tel: +60 (03) 21414587
Fax: +60 (03) 21487440
Website: www.rainbowrunner.net

Dealer/Distributor**MALDIVES****MARKETECH MALDIVES PVT LTD**

M.Iramaa, 1st Floor, Fareedhi Magu
Rep of Maldives
Tel: +(960) 3331911
Fax: +(960) 3318815
Email: ahmed@marketechmaldives.com

Dealer/Distributor**NEW ZEALAND****AIR TECHNOLOGY LTD**

5/20 Constellation Drive
Mairangi Bay 0632 Auckland
PO Box 305065 Triton Plaza
North Shore, Auckland 0757, New Zealand
Contact: Ross Irvine
Tel: 64-9-478 9995 Fax: 64-9-478 6221
Website: www.divecompressors.co.nz

Dealer/Distributor**PHILIPPINES****AQUAMUNDO SPORTS INC**

G/FVernida I Bldg.
120 Amorsolo St. Legaspi Village
Makati City, Philippines 1229
Tel: (+632) 813-AQUA (2782)
(+632) 817-AQUA (2782)
Fax: Dial local 13
Email: info@aquamundosports.com,
scuba@aquamundosports.com

Dealer/Distributor**SINGAPORE****ALLROUND ADVANCED TECHNOLOGIES PTE LTD**

105 Sims Ave #03-06 Chancery Lodge Complex
Singapore 387429
Tel: +65 749 2778
Fax: +65 749 2977
Email: enquiry@allround.com.sg

Dealer/Distributor**KOREA, REPUBLIC OF****DAE WOONG SUITS CO LTD**

1614-15, Seocho-Dong, Seocho-Ku, Seoul, Korea
Tel: 82-2-588-0970 Fax: 82-2-587-0392
Email: mares@mares.co.kr
Website: www.mares.co.kr

Dealer/Distributor**TAIWAN****NELVEN CO LTD**

14F-6, No. 76, Sec. 1
Fu-Shings South Rd, Taipei City 106, Taiwan
Tel: (886) 2-2721-9770 Fax: (886)2-8773-2047
Email: nelven@ms18.hinet.net
Website: www.nelven.com.tw

Dealer/Distributor**THAILAND, VIETNAM, CAMBODIA, SRI LANKA****SIAM DIVING ENTERPRISES ASIA PACIFIC CO LTD**

No.12, Chaloemprakiat Ratchakan Thi 9 Road
Soi 48, Dokmai, Prawet, Bangkok, 10250, Thailand
Tel: +66 2 726-6101-5
Fax: +66 2 726-6106
Email: c.benelli@aerotecnicacoltriasiapacific.com,
sdesystems@csloxinfo.com
Website: www.aerotecnicacoltriasiapacific.com

Dealer/Distributor**VIETNAM****SCUBA SUPPLY**

120/54a Nguyen Thien Thuat Street, Nha Trang,
Vietnam
Tel: +84 (0) 914 029 790
Fax: +84 (0) 58 252 0576
Email: craig@scubavietnam.com
Website: www.scubavietnam.com

Dealer/Distributor

CON-SPACE COMMUNICATIONS

CHINA

ANCOM SYSTEMS, INC

Building 5, Courtyard 10, Beijing
Contact: Wang, Jacinta F
Tel: 86-10-6202-2792
Email: jwang@ancom.cn

Dealer/Distributor

BEIJING CBT MACHINE & ELECTRIC EQUIPMENT INC

Room 503, Building H
Timecourt, No. 6 yard, Beijing
Contact: Chou, Yu
Tel: 010-84440107/8 Email: hillcity1@yahoo.com

Dealer/Distributor

OCEANS SAFETY EQUIP CO LTD

Rm19A 10 & 11, Jazz Mansion, Shenzhen
Contact: Zhang, Echo
Tel: 86-755-8328-0633
Email: andy_oceans@hotmail.com

Dealer/Distributor

WUXI NEW FIRETRE SAFETECH LTD

Block 3 Long Shan Wen Bo Industrial Park
Wuxi, Jiang Su PRC
Contact: Wang, Chad
Tel: 86 510 139 0619 8090
Email: chwang1001@hotmail.com
Website: www.wfs.com.cn

Dealer/Distributor

HONG KONG

EASTERN FORUM FE CO LTD

Unit A2, 1/F No 1123 Canton Road, Mongkok
Contact: Fung, Eddy K P
Tel: 852-278-734-64
Email: efung@rescue.com.hk
Website: www.rescue.com.hk

Dealer/Distributor

SUPREME CO

Room 1812, Park-In Commercial Center, Mong Kok
Contact: Chau, Gary
Tel: 852-27808818 Email: info@supremeco.com.hk
Website: www.supremeco.com.hk

Dealer/Distributor

INDONESIA

P.T. MITRA TEKNIKATAMA

Jl Ekor Kuning No: 1, Jakarta
Contact: Prabowo, Budhi
Tel: 62-21 6602144
Email: mitra.teknikatama@gmail.com

Dealer/Distributor

JAPAN

TEISEN – TEIKOKU SERI-I CO LTD

103-0027, Tokyo
Contact: Katano, Yasu
Tel: 81 3 3281 3033
Email: yasuhide.katano@teisen.co.jp
Website: www.teisen.co.jp

Dealer/Distributor

KOREA

KEO WHA R & F CO LTD

RM 1, FL 1, Jiwoo Building, Seoul
Contact: Zyung, Kenneth
Tel: 82 02 335 0145 7
Email: jfckenneth@yahoo.co.kr

Dealer/Distributor

MACAO

ARTIGOS ELECTRICOS TICO

Rua Dos Pescadores
180 Edf. Ind. Veng Hou,
7 And. Macau
Contact: Weng Kei, Leong
Tel: 853-28923023
Email: tico@macau.ctm.net
Website: www.tico.com.mo

Dealer/Distributor

MALAYSIA

ALL DEFENCE TECHNOLOGY PTE LTD

14 Jansen Close, Singapore
Contact: Phua Augustine
Tel: 065 6387 8887 Email: gus@alldefence.qsurf.org

Dealer/Distributor

WASILAH HOLDINGS SDN BHD

No 15 & 17, Jin 3/4C, Kuala Lumpur
Contact: Abdullah, Nor Aziliza
Tel: 603 410 761 01
Email: azliza@wasilahholdings.com

Dealer/Distributor

PHILIPPINES

RESQTEK INDUSTRIAL SALES

402 Paltoc St. Sta. Mesa, Manila
Contact: Agudo, Donn
Tel: 632 715 3660 Email: resqtek@gmail.com

Dealer/Distributor

SINGAPORE

DEFENCE SECURITY PTD LTD

37 Yu Li Industrial Bldg, Singapore
Contact: Lim, Robert
Tel: 674-32-180
Email: robertlim@defencesecurity.com.sg
Website: www.defencesecurity.com.sg

Dealer/Distributor

TAIWAN

SUPER PREMIUM CO LTD

18F-5, No. 16, Jian Ba Road
Chung Ho City
Contact: Yeh, Annie
Tel: 886-2-822-65-855 Email: spctwn@ms9.hinet.net

Dealer/Distributor

THAILAND

S.P. & ASSOCIATES LTD

40/747 1st Fl Moo 10 Nuanjan R
Khet Buengkum
Contact: Eddie, E
Tel: 66-2-946-1593-98
Email: sp@sp-associates.co.th

Dealer/Distributor

SEA AIR THAI CO LTD

98 Soi Ramintra 49, Bangkok
Contact: Raskin, Craig
Tel: 668-7900-0783
Email: craskin@gmail.com
Website: www.seaairthai.com

Dealer/Distributor

VIETNAM

APTES VIETNAM, JSC

Ground floor, 39 Nguyen Trai Tower, Ha Noi
Contact: Le Tung, Dao
Tel: 84 4 568 1886
Email: tung.dao@aptcs.com.vn
Website: www.aptcs.com.vn

Dealer/Distributor

LACVIET TECHNICAL SCIENTIFIC & ELECTRIC CO LTD

152 Nguyen Hong Dao Str Ward 14
Ho Chi Minh City
Contact: Nguyen, Tuan
Tel: 84 8 8492 734 Email: bpkd_lacvietco@hcm.fpt.vn
Website: www.lacviettech.com.vn

Dealer/Distributor



AUSTRALIA

KDW CONSULTING LLC
3023 Sonoma Way, Viera, FL 32955, USA
Contact: Kenton D Warner
Tel: 321 636 4543 Fax: 928 438 6382
Email: kenwarner@att.net
Website: www.cuttersedge.com

Representative Office

CHINA

ANCOM
Building 5, Courtyard 10 Village
Middleroad
North 3rd Ring Road
Contact: Pei Zhang
Tel: 86 10 6202 2792
Fax: 86 10 6207 7929
Email: hung.fang@utoronto.ca
Website: www.ancom.cn/www.cuttersedge.com

Dealer/Distributor

NORLAN ENTERPRISES INC

Room 952, #218 Tang Li Road
China
Contact: Helen Wang
Tel: 86 10 8467 3721/8467 3722
Fax: 86 10 8467 3770
Email: helenwang@norlan.cn
Website: www.norlan.cn/www.cuttersedge.com

Dealer/Distributor

WUXI NEW FIRETRE SAFETECH LTD

Block 3, Long Shan Wen Bo Industrial Park
Qian Yao Road
Hu Bin District
Wuxi, Jiangsu Province, PRC 214151
Tel: +86 510 8225 5991
Fax: +86 510 8275 4257
Email: mail@wfs.com.cn
Website: www.wfs.com.cn

Dealer/Distributor

INDIA

ASKA EQUIPMENTS LTD

Aska House, 193 Deepali
Deepali Chowk
Outer Ring Road – Pitampura
New Delhi 110 034, India
Contact: Navdeep Garg
Tel: 91 11 27014416/27014417
Fax: 91 11 27014413
Email: info@askagroup.com
Website: www.askagroup.com/
www.cuttersedge.com

Dealer/Distributor

ISRAEL

OFER FIRE RESCUE & SALVAGE LTD

Binyamina 30500
Israel
Contact: Ofer Halamish
Tel: 972 4 6288444
Fax: 972 4 6288555
Email: ofer@ofer.co.il
Website: www.ofco.il/www.cuttersedge.com

Dealer/Distributor

JAPAN

TEIKOKU SEN-I CO LTD

5-13,2 Chome
Nihonbashi
Chuo-Ku
Tokyo 103
Japan
Tel: 81-3-3281-3026
Fax: 81-3-3274-6397
Email: teisen-tyo@teisen.co.jp
Website: www.teisen.co.jp/www.cuttersedge.com

Dealer/Distributor

KOREA

KDW CONSULTING LLC

3023 Sonoma Way, Viera
FL 32955, USA
Contact: Kenton D Warner
Tel: 321 636 4543
Fax: 928 438 6382
Email: kenwarner@att.net
Website: www.cuttersedge.com

Representative Office

MALAYSIA

CITO MARKETING, SDN BHD

No. 11, Jalan SS15/4B
Subang Jaya
47500 Petaling Jaya
Selangor
Darul Ehsan
Contact: Ahmad Nazmi Abu Raihan
Tel: +603 5631 1286
Fax: +603 5634 0583
Email: info@citogroup.com.my
nazmi@citogroup.com.my
Website: www.cuttersedge.com

Dealer/Distributor

PHILLIPINES

KDW CONSULTING LLC

3023 Sonoma Way, Viera
FL 32955 USA
Contact: Kenton D Warner
Tel: 321 636 4543
Fax: 928 438 6382
Email: kenwarner@att.net
Website: www.cuttersedge.com

Representative Office

SINGAPORE**KDW CONSULTING LLC**

3023 Sonoma Way, Viera, FL 32955 USA
 Contact: Kenton D Warner
 Tel: 321 636 4543
 Fax: 928 438 6382
 Email: kenwarner@att.net
 Website: www.cuttersedge.com

Representative Office**SOUTH KOREA****JINUTEC INTERNATIONAL DIVISION**

711 Visiontop Officetel 374-4
 Won-Dong, Osan-City, South Korea
 Contact: Na Hae-Yul
 Tel: 82 31 375 8558
 Fax: 82 31 375 4884
 Email: hyna@jinutec.com
 Website: www.jinutec.com/www.cuttersedge.com

Dealer/Distributor**THAILAND****KDW CONSULTING LLC**

3023 Sonoma Way, Viera, FL 32955 USA
 Contact: Kenton D Warner
 Tel: 321 636 4543
 Fax: 928 438 6382
 Email: kenwarner@att.net
 Website: www.cuttersedge.com

Representative Office**Dräger****AUSTRALIA****DRAEGER SAFETY PACIFIC**

Axxess Corporate Park, Unit 99, 45 Gilby Road
 Mount Waverley, Victoria 3149
 Tel: +61 3 9265 5000
 Fax: +61 3 9265 5097
 Email: customer.service@draeger.com

Representative Office**CHINA****BEIJING FORTUNE DRAEGER SAFETY EQUIPMENT CO LTD**

Yu An Lu 22, B Area
 Beijing Tianzhu Airport Industrial Zone
 Shunyi District, Beijing, 101300
 Tel: +86 10 8049 8000
 Fax: +86 10 8049 8005
 Email: sales.safety.cn@draeger.com

Representative Office**INDIA****JOSEPH LESLIE DRAEGER MFG PVT LTD**

Leslico House, Prof. Agashe Road
 Off 87-C, Bhavani Shankar Road
 Dadar (West), Mumbai 400028
 Tel: +91-22-2422 1880/1878/7198
 Fax: +91-22-2430 3705
 Email: mumbai@lesliedraeger.com

Representative Office**INDONESIA****PT DRAEGERINDO JAYA**

Beverly Antasari Building
 Jl. Pangeran Antasari No. 67, Unit L
 Cilandak Barat, Jakarta, Selatan 12430
 Tel: +6221 751 3289
 Fax: +6221 751 2052
 Email: product_support@draeger.co.id

Representative Office**JAPAN****DRAEGER SAFETY JAPAN LTD**

3-8-1 Toyo Koto-ku, Tokyo, Japan
 Japan Zip 135-0016
 Tel: +81 3 44 615111
 Fax: +81 3 44 615100
 Email: sales.safety.jp@draeger.com

Representative Office**KOREA****DRAEGER SAFETY ASIA**

Daeyong Bld. #1106
 Bang-l-dong, Songpa gu, Seoul, Korea
 Tel: +82 2 6415 8222
 Fax: +82 2 6415 8223
 Email: sdseo3@magincn.com

Representative Office**MALAYSIA****DRAEGER SAFETY ASIA PTE LTD**

No. 14, Jalan PJS 11/18
 Bandar Sunway 46150
 Petaling Jaya, Malaysia
 Tel: +60 3 5635 6460
 Fax: +60 3 5635 4171
 Email: dsa.malaysia@draeger.com

Representative Office**NEW ZEALAND****DRAEGER SAFETY PACIFIC PTE LTD**

Unit O, No. 150
 Harris Road
 East Tamaki, Auckland
 Tel: +649 273 3160
 Fax: +649 273 3159
 Email: customer.service@draeger.com

Representative Office**SINGAPORE****DRAEGER SAFETY ASIA PTE LTD**

67 Ayer Rajah Crescent #06-03
 Singapore 139950
 Tel: +65 6872 9281
 Fax: +65 6512 1908
 Email: dsa.singapore@draeger.com
 Website: www.draeger.com.sg

Regional Head Office**TAIWAN****DRAEGER SAFETY TAIWAN CO LTD**

12/F, Kuohwa Building
 868-5 Chungcheng Road
 Chungho City
 Taipei County, 235 Taiwan R.O.C.
 Tel: +886 (02)2223-6388
 Fax: +886 (02)2223-2258
 Email: sales.taiwan@draeger.com

Representative Office**THAILAND****DRAEGER SAFETY (THAILAND) LTD**

123/20, Nonsi Road
 Kwaeng Chongnonsi
 Khet Yannawa
 Bangkok 10120
 Tel: +662 6811 781 (4 lines)
 Fax: +662 6811 780
 Email: sales.thailand@draeger.com

Representative Office**VIETNAM****DRAEGER SAFETY ASIA PTE LTD**

No. 5, A2 Nguyen Khanh Toan Str.
 Cau Giay District
 Hanoi
 Vietnam
 Tel: +84 4 281 3463
 Fax: +84 4 281 3461
 Email: sales.safety.vn@draeger.com

Representative Office**DUPONT FIRE EXTINGUISHANTS****UNITED ARAB EMIRATES****FENWAL PROTECTION SYSTEMS**

Bu Aameem Building II
 Suite 201
 PO Box 30791
 Dubai
 United Arab Emirates
 Contact: Tareq El-Iman
 Tel: 971 4.337.2498
 Fax: 971 4.337.5088
 Email: tareq.imam@kiddeme.co.ae
 Website: www.fenwalfire.com

Dealer/Distributor**KIDDE FIRE SYSTEMS**

Bu Aameem Building II
 Suite 201
 PO Box 30791, Dubai
 United Arab Emirates
 Contact: Tareq El-Iman
 Tel: 971 4.337.2498
 Fax: 971 4.337.5088
 Email: tareq.imam@kiddeme.co.ae
 Website: www.kiddefiresystems.com

Dealer/Distributor**AUSTRALIA****FIRE PROTECTION TECHNOLOGIES PTY LTD**

Unit 14, 42-44 Garden Blvd
 Dingley, Victoria 3712
 Australia
 Tel: +61 3 9558 0715
 Fax: +61 3 9558 0725
 Email: Enquiries@fire-protection.com.au
 Website: www.fire-protection.com.au

Dealer/Distributor**BANGLADESH****NAVANA INTERLINKS LTD**

7, Champaklal Udyog Bhavan
 Sion (E) Mumbai 400 022, India
 Tel: +88 02-9892911
 Fax: +88 02-9895252
 Email: info@navana-iv.com
 Website: www.navana-iv.com

Dealer/Distributor**HONG KONG****THE JARDINE ENGINEERING CORPORATION LTD**

13/F Somerset House, Taikoo Place
 979 King's Road, Hong Kong
 Tel: +852 2807 4684
 Fax: +852 2503 4210
 Email: yick-kuen.kwong@jec.com
 Website: www.jec.com

Dealer/Distributor**INDIA****NEWAGE FIRE PROTECTION ENGINEERS**

Champaklal Udyog Bhavan
 Unit No. 7, Sion (East)
 Mumbai 100 022, India
 Tel: +91 22 2407 7421
 Fax: +91 22 2407 4229
 Email: info@newage-india.com
 Website: www.newage-india.com

Dealer/Distributor**INDONESIA****KARYA LESTARI MAKMUR PT**

Jl. Pangeran Jayakarta
 85AK, Jakarta 10730, Indonesia
 Tel: +62 21 628 1933
 Fax: +62 21 628 1976
 Email: johnklima@cbn.net.id

Dealer/Distributor**KOREA****PARADISE INDUSTRY CO LTD**

#683-116 Hannam-Dong
 Yongsan-Ku
 Seoul, South Korea
 Tel: +82 2 3780 8770
 Fax: +82 2 3780 8772
 Email: shlee@paradise-ind.co.kr
 Website: www.paradise-ind.co.kr

Dealer/Distributor**MALAYSIA****FIKE ASIA PACIFIC SDN BHD**

18B, 2nd Floor, Jalan Astak L U8/L
 Bukit Jelutong
 40150 Shah Alam
 Selangor, Malaysia
 Tel: +60 3 7859 1462
 Fax: +60 3 7859 1461
 Email: chun-wah.leong@fike.com
 Website: www.fike.com

Representative Office**SUKIADA ENGINEERING SDN BHD**

No. 20 Jalan Astaka L U8/L
 Bukit Jelutong
 40150 Shah Alam
 Selangor, Malaysia
 Tel: +60 3 7845 2008
 Fax: +60 3 7845 6008
 Email: bk Wong@sukiada.com.my
 Website: www.sukiada.com.my

Dealer/Distributor

PAKISTAN**MGH ENGINEERING AND CONTROL PVT LTD**

H. # 20 St., #5/A Kot Shahabdin
Shahdrah, Lahore 54950, Pakistan
Tel: +92 42 7913064
Fax: +92 42 7913064
Email: mansoorshaker@yahoo.com
Website: www.mgheng.com

Dealer/Distributor**PHILIPPINES****FIRE SOLUTIONS INC**

1028 Malaya Street, Malanday
Marikina City, 1805 Philippines
Tel: +63 2 371 9774
Fax: +63 2 374 3041
Email: firesolutions@skyinet.net

Dealer/Distributor**SINGAPORE****AZCEND ASIA PTE LTD**

Blk 21, Kallang Avenue #04-165, Singapore 339412
Tel: (65) 6299 0798
Fax: (65) 6299 3735
Email: rtiong@azcendasia.sg

Representative Office**SRI LANKA****BUILDING SERVICES (M&E) ENGINEER INTERNATIONAL PVT LTD**

No. 20/39, Fairfield Gardens, Colombo 08, Sri Lanka
Tel: +94 11 4717 500
Fax: +94 11 2667 569
Email: bldserv@sltnet.lk

Dealer/Distributor**TAIWAN****SUNMORN INC**

7F-2, 76, Nan Jing W. Road, Taipei 10352, Taiwan
Tel: +886 2 2550 3500
Fax: +886 2 2550 5350
Email: merylyu@sunmoreinc.com
Website: www.sunmoreinc.com

Dealer/Distributor**THAILAND****ANTI-FIRE CO LTD**

316-316/1, Sukhumvit 22 Road
Klongtoey, Bangkok 10110, Thailand
Tel: +66 2 260 4565
Fax: +66 2 258 2422
Email: sithichai@antifire.com
Website: www.antifire.com

Dealer/Distributor**VIETNAM****EUROPEAN TECH JSC**

No. 50, 218/27, Lac Long Quan Street
Tay Ho Dist., Hanoi, Vietnam
Tel: +84 4 3755 7179
Fax: +84 4 3755 7178
Email: mscee@vnn.vn

Dealer/Distributor**FIRE FIGHTING ENTERPRISES****AUSTRALIA****AMPAC TECHNOLOGY PTY LTD**

7 Ledger Road, Balcatta, Western Australia 6021
Tel: +618 9242 3333
Fax: +618 9242 3334
Website: www.ampac.net

Dealer/Distributor**BAHRAIN****KHAYBER TRADING COMPANY**

W.L.L, PO Box No. 1976, Cr.No. 40189-01
Manama, Bahrain

Dealer/Distributor**CYPRUS****M.T. PIPERARIS TRADING LTD**

Nafpactou 19a, Lemesos 3051, Cyprus
Tel: +357 5 737311
Fax: +357 5 737310

Dealer/Distributor**ISRAEL****TELEFIRE FIRE & GAS**

Detectors Ltd, PO Box 7036
Petach-Tikva 49250, Israel
Tel: +972 3 9211955
Fax: +972 3 9211816

Dealer/Distributor**IRAN****NAR KOOB IRAN**

Apt 7, 3rd Floor, No 32, Varavini St.
Amir Atabak, St. Ostad Motahari Ave.
Tehran – Iran
Tel: +98 21 88842649
Fax: +98 21 88307405

Dealer/Distributor**KOREA****HI MAX CO LTD**

Sicox Tower, 115-Ho 513-14
Sangdaewon-Dong, Jungwon-Gu
Sunghnam-City
Kyungki Do, Korea
Tel: +82 31 769 7698

Dealer/Distributor**MALAYSIA****FITTERS ENG SERVS SDN BHD**

No.1 Block C, Jalan Dataran
Sd1 Pju 9
52200 Bandar Sri, Damansara
Kuala Lumpur, Malaysia
Tel: +60 3 62767155
Fax: +60 3 62758712

Dealer/Distributor**NEW ZEALAND****AMPAC INDUSTRIES LTD**

PO Box 100-149
North Shore Mail Centre
Glenfield, Auckland
Tel: +64 94438072
Fax: +64 94438073

Dealer/Distributor**QATAR****AL SHAIBEH ESTABLISHMENT**

PO Box 3975
Doha, Qatar
Tel: +974 4322140
Fax: +974 4416650

Dealer/Distributor**SINGAPORE****ACCLAIM SYSTEMS PTE LTD**

Blk 104, Boon Keng Road, 05-01
Singapore 339775
Tel: +656 2990 798
Fax: +656 299 3735

Dealer/Distributor**ALARM SUPPLY PTE LTD**

63 Jalan Pemimpin, 03-07
Pemimpin Industrial Bldg
Singapore 577219
Tel: 00 656 258 3445
Fax: 00 656 258 6428

Dealer/Distributor**SRI LANKA****FIRETECH (PVT) LTD**

34, Walter Gunasekara
Mawatha, Nawala
Sri Lanka
Tel: +94 1 806613
Fax: +94 1 806666

Dealer/Distributor**SYRIA****ESS COMPANY**

PO Box 35478, Damascus, Syria

Dealer/Distributor**TAIWAN****HORING LIH IND CO LTD**

4f No 18 Lane 327
Chung Shan Road
Sec 2 Chung-Ho-City
Taipei Hsien, Taiwan
Tel: +886 2224 87599
Fax: +886 2224 07752

Dealer/Distributor**THAILAND****TEEYA MASTER SYSTS CO LTD**

100/101-102 Vongvanji
Building B, 30th Flr
Rama 9 Road
Huaykhwang
Bangkok 10320, Thailand
Tel: +662 2 6451130
Fax: +662 2 2488540

Dealer/Distributor**UNITED ARAB EMIRATES****NAFFCO**

PO Box 17014
Jebel Ali Free Zone Area
Dubai, U.A.E
Tel: +971 4 881 5653
Fax: +971 4 881 6229

Dealer/Distributor**TELECTRON**

PO Box 2946
Al Salam Street
Bldg. No.5, Abu Dhabi, U.A.E
Tel: +971 26795333
Fax: +971 26794609

Dealer/Distributor**HOLMATRO RESCUE EQUIPMENT****AUSTRALIA****CHUBB FIRE SAFETY LTD**

120, Silverwater Road
Silverwater, NSW 2128
Locked Bag 102
Silverwater 1811
Contact: Andrew Loftus
Tel: 1300 369 309
Fax: 02 8748 7450
Email: firesafety@chubb.com.au
Website: www.chubb.com.au

Dealer/Distributor**BRUNEI****IECS SDN BHD**

13A Simpang 544-22
Jalan Jerudong
B.S.B. Brunei Darussalam
Contact: Roger Sim
Tel: +673 2 612 717
Fax: +673 2 612 720
Email: iececs.brunei@gmail.com

Dealer/Distributor**CHINA****HOLMATRO CHINA****UNIT 14/D – 9 JOY TOWER**

9 Zhen Ning Road
Shanghai 200050
P. R. China
Contact: Floris Evers
Tel: +86 21 5238 7330
Fax: +86 21 5238 7320
Email: china@holmatro.com
Website: www.holmatro-china.com

Representative Office**HONG KONG****ABLESLINK CO LTD**

Unit B4, 2/F., Block B
Sheung Shui Plaza
3 Ka Fu Close
Sheung Shui, N.T.
Hong Kong
Contact: Mr Randy Hau
Tel: +852-2466 4568
Fax: +852-2466 4569
Email: ableslink@yahoo.com

Dealer/Distributor**INDONESIA****PT ESA KARYA MANDIRI****JL.SUNTER PARADISE**

Timur Raya, F21 No. C42
Jakarta 14350
Contact: Mr Benny N Liem
Tel: 062-21-6412936/65303502
Fax: 062-21-6412937
Email: esakarya@cbn.net.id

Dealer/Distributor

JAPAN**AKAO & CO LTD**

4-13-1 Shinmachi Nishi-ku, Osaka
Japan 550-0013
Contact: Masaya Saga
Tel: +81-6-6532-6256
Fax: +81-6-6532-3095
Email: info@akao-co.co.jp
Website: www.akao-co.co.jp

Dealer/Distributor**KOREA (SOUTH)****KEO WHA HITEC CO LTD**

Rm-1F1, Jiwoo Bldg, 376-12
Seogyo-dong, Mapo-gu, Seoul, Korea
Contact: Mr Kenneth Zyung
Tel: 82-(02)-336-0145-7
Fax: 82-(02)-336-0180
Email: jfckenneth@yahoo.co.kr
Website: www.kh-hitec.com

Dealer/Distributor**MACAU SAR****TCT TRI-CONTINENTAL TRADING COMPANY LTD**

4/F-“E”, Dynasty Plaza Bldg., 411-417
Ald. Dr. Carlos D'Assumpcao Macau S.A.R.
Contact: John Ferreira
Tel: +853 2875-0008
Fax: +853 2875-0007
Email: sales@tct.com.mo, john@tct.com.mo,
hanson@tct.com.mo
Website: www.tct.com.mo

Dealer/Distributor**MALAYSIA****PANDAN NIAGA SDN BHD**

No. 81A
Jalan Tabla 33/21
Shah Alam Technology Park
Seksyen 333, 40400 Shah Alam
Selangor Darul Ehsan, Malaysia
Contact: Mohd Rashdi Abd Rahman
Tel: +603 5122 1310
Fax: +603 5122 1279
Email: pnsb@pn.com.my

Dealer/Distributor**NEW ZEALAND****CHUBB FIRE & SAFETY**

3 Fisher Crescent
Mt Wellington
Auckland
Contact: Steve Kirk
Tel: +64 9 270 7441
Fax: +64 9 270 7235
Email: fireandsafety@chubb.co.nz
Website: www.chubb.co.nz

Dealer/Distributor**PHILIPPINES****WALLGREEN INDUSTRIAL VENTURES CORP**

62 West Avenue
Quezon City
Philippines 1104
Contact: Francisco C Dizon
Tel: +6 32 411 0818
Mobile: +6 32 0917 820 1947
Fax: +6 32 411 0818
Email: wvivor@yahoo.com

Dealer/Distributor**SINGAPORE****FABRISTEEL PRIVATE LIMITED**

9, Tuas Ave 10
Singapore 639133
Contact: Adros Sunan/Spencer Ong
Tel: +65 68623830
Fax: +65 68615988
Email: adros.sunan@fabristeel.com.sg

Dealer/Distributor**SRI LANKA****HALCHEM LANKA PVT LTD**

7, Siri Dhamma Mawatha, Colombo 10
Contact: Cyril Halloluwa
Tel: +94 11 5843213
Mobile: +94 777 315 375
Fax: +94 11 2674 615 and 2792 406
Email: sales@halchem-lanka.com
Website: www.halchem-lanka.com

Dealer/Distributor**TAIWAN****PARKSON TRADING CO LTD**

No. 50, 3F
Hua-Ning Rd, Guo Shan Dist.
80471 Kaohsiung City
Taiwan, R.O.C.
Contact: Mr Johnson Peng
Tel: +886-7-552-1650
Fax: +886-7-552-7999
Email: ptckpeng@parkson.com.tw

Dealer/Distributor**AUSTRALIA****ADA (AUSTRALIAN DEFENSE APPAREL PTD LTD)**

14 Gaffney Street
Coburg, Victoria 3058
Contact: Rob Walsh, Sales & Marketing Manager
Emergency Services
Tel: +61 3 9353 4552
Email: rob@ada.com.au
Website: www.ada.com.au

Garment Maker**BRUCK**

Units 12/13
79-83 High Street
KEW Victoria 3101
Australia
Contact: Michael Smith
Tel: +61 4 0324 7309
Email: MSmith@Bruck.com.au

Approved PBI Weaver**LION APPAREL – ASIA PACIFIC**

Asia Pacific – Protective Systems Group
Unit 3, 15 Dunstan Road, Wingfield
South Australia
5013 Australia
Contact: Warren Hoare, Regional Managing Director
Tel: +61 8 8139 7777
Email: warrenh@lionapparel.com

Garment Maker**PAC FIRE**

Unit 1, 28 Burnside Road
Hallmarc Business Park
Yatala Qld 4207
Australia
Contact: Keith Ward, Managing Director
Tel: +61 7 3441 7100
Email: keith@pacfire.com.au

Garment Maker**STEWART & HEATON**

150 Francisco Street
Belmont WA 6104 Australia
Contact: Brian Thomson, Business Development Manager
Tel: +61 8 9277 5555
Email: brian.thomson@shcc.com.au

Garment Maker**CHINA****YINGTELAI TECHNOLOGY CO LTD**

76 Xihuan Road
ChangPing District
Beijing 102200, China
Contact: Xue Feng LIU, Vice Chairman General Manager
Tel: +86 10 6974 2811
Email: xuefeng@yingtelai.com

Garment Maker**HONG KONG****WAH TAI ENTERPRISES LTD**

7/F Block F
Golden Bear Industrial Centre
66-82 Chai Wan KOK Street
Tsuen Wan N.T. Hong Kong
Hong Kong SAR
Contact: Johnny Ho, President, Special Products Division
Tel: +852 2771 6360
Email: jho@wah-tai.com

Agent**KOREA****SEOJIN TEX**

Room 201 Kum Ho Building, Soongin-Dong
Jongro-gu Seoul, 110550
Korea (Republic of)
Contact: C J Yoon, Director
Tel: +82 22 253-7905
Email: seojintex@naver.com

Weaver**KOREA****SAN CHEONG COMPANY LTD**

185 Songmoon-Ri-Myun
Cheoin-Gu, Yongin-si, Gyeonggi-Do 449-823
Korea (Republic of)
Contact: Soo Youk Lee
Tel: +82 31 321 4077
Email: isu@sancheong.com
Website: www.sancheong.com

Garment Maker**PELICAN PRODUCTS****AUSTRALIA****PELICAN PRODUCTS PTY LTD**

Suite 2.33, Platinum West 4 Ilya Avenue
Erina NSW 2250 Australia
Tel: +612 4367 7022
Fax: +612 4367 7066
Email: info@pelicanaustralia.com
Website: www.pelicanaustralia.com

Regional Head Office**NEW ZEALAND****CHUBB FIRE AND SAFETY**

3 Fisher Crescent Mount Wellington
Auckland 2023, New Zealand
Tel: +64 (0)9 270 7234
Fax: +64 (0)9 270 7235
Email: fireandsafety@chubb.co.nz
Website: www.chubb.co.nz

Dealer/Distributor**SECURITON****ASIA PACIFIC****SECURITON (M) SDN BHD**

No. 19A, Lorong Rahim Kajai 13
Taman Tun Dr. Ismail, MY-60000
Kuala Lumpur, Malaysia
Contact: Mr Lewis Chong
Tel: +60 3 7725 1699
Fax: +60 3 7725 1677
Email: asia@securiton.com.my
Website: www.securiton.com

Representative Office**AUSTRALIA****AUSTRALIAN FIRE ENTERPRISES (AFE)**

PO Box 7027, Manning Park
NSW 2259, Australia
Contact: Mr Mike Donegan/Mr Brett Gordan
Tel: +61 2 43 592 244
Fax: +61 2 43 593 301
Email: sales@austfire.com.au/afe@ozemail.com.au

Dealer/Distributor**NATIONAL SECURITY & SURVEILLANCE**

38 Lambert Street Richmond
Victoria 3121
Australia
Contact: Mr Dominic Paruit
Tel: +61 3 9428 8055
Fax: +61 3 9428 8065
Email: dominic.paruit@natss.com.au
Website: www.natss.com.au

Dealer/Distributor**CHINA, BEIJING****SECURITONG FIRE TECHNOLOGY LIMITED COMPANY**

Room 2101, Block 1, No. 58
East 3rd Ring South Road
Chaoyang Area
Beijing, China
Contact: Mr Gong Xinjun
Tel: +86 10 5867 2076
Fax: +86 10 5867 3319
Email: gxjbj@163.com

Dealer/Distributor

SWISS SECURITAS FIRE AND SECURITY SYSTEMS TECHNOLOGY (BEIJING) CO LTD

Room 1808-11
18th Floor Shouchuang Mansion
No.6 North Street, Chaoyangmen
Dongcheng Area
Beijing 100027, P.R.China
Contact: Mr Lewis Chong/Mr Todd Zeng
Tel: +86 10 6406 0558
Fax: +86 10 6406 6934
Email: todd.zeng@securiton.cn
Website: www.securiton.cn

Dealer/Distributor**BEIJING Z-N MECHANICAL & ELECTRICAL EQUIPMENT CO LTD**

1 #B910, Lingdi Office
No.13 Beiyuan Lu
Chaoyang District Beijing, China 100012
Contact: Ms Sarah Zhang
Tel: +86 10 5207 3836
Fax: +86 10 5207 3839
Email: sarahzh@vip.sina.com/
bjzhongna@yahoo.com.cn

Dealer/Distributor**CHINA, SHANGHAI****BARTEC ELECTRIC (SHANGHAI) CO LTD**

New Building 7, No. 188
Xinjun Ring Road, Shanghai Caohejing
Pujiang Hi-Tech Park (Pudong Area)
Minhang District 201114
Shanghai P.R. China
Contact: Mr Banson Tang
Tel: +86 21 3463 7288 ext: 251
Fax: +86 21 3463 7282
Email: fanmin@bartec.com.cn
Website: www.bartec.com.cn

Dealer/Distributor**DEF CHINA**

2nd Floor Building 135.
No.1421 East Zhuanxing Road
Minhang Area, Shanghai 201108
Contact: Mr Francois Yang
Tel: +86 21 3350 7133- +86 21 3350 8012
Fax: +86 21 3350 7285
Email: farech@sh163.net
Website: www.def-online.com

Dealer/Distributor**SWISS SECURITAS (BEIJING) CO LTD SHANGHAI COMPANY**

Room A, 23rd Floor Shimei Mansion
No. 445 Jiangning Road
Jing'an Area, Shanghai 200041
P.R.China
Contact: Mr Lewis Chong/Mr Todd Zeng
Tel: +86 21 5228 8111
Fax: +86 21 5228 8325
Email: todd.zeng@securiton.cn

Dealer/Distributor**SHANGHAI ZHENYE INDUSTRY CO LTD**

No. 3 221, Cao Bao L
Shanghai, 200233
Contact: Mr Jack Shen
Tel: +86 21 6451 2922/2933
Fax: +86 21 6451 9955
Email: sy1199@163.com
Website: www.shzhenye.com

Dealer/Distributor**CHINA, SHENZHEN****FANWO GROUP**

18F, China Economic and Trade Building
Zizhuqida, Futian District
Shenzhen, China 518040
Contact: Dr Yao
Tel: +86 755 83222 076/+86 755 83222 872
Fax: +86 755 83222 311
Email: yaohaowei@gmail.com
Website: www.china-hrd.com

Dealer/Distributor**SHENZHEN YAOHUAJI CHINA CO LTD**

RM.F, 20th Floor Yong – Hui Building
Guo-Qi Building, Shenzhen
Contact: Mr Raymond Ng/Ms Shi
Tel: +86 755 8212 9831
Fax: +86 755 8212 9909
Email: rng@ywk.com.hk
Website: www.ywk.com.hk

Dealer/Distributor**HONG KONG****YIU WAH (KOGARAH) CO LTD**

Room 901
9th Floor
No 113 Argyle Street
Mongkok
Kowloon
Hong Kong
Contact: Mr Raymond Ng
Tel: +852 2781 1384
Fax: +852 2782 6652
Email: ywk@ywk.com.hk
Website: www.ywk.com.hk

Dealer/Distributor**INDIA, MUMBAI****BAJAJ ELECTRICALS LTD**

15/17, Sant Savta Marg
Reay Road
Mumbai – 400010
Contact: Mr Ravichandran Sr. (General Manager)
Tel: +91 22 2372 4192
Fax: +91 22 2373 0504
Email: bms@bajajelectricals.com
Website: www.bajajelectricals.com

Dealer/Distributor**VIMAL FIRE CONTROLS PVT LTD**

19/20 Vardhaman Service
Industrial Estate
L.B.S. Marg.
IN-400083
Vikhroii (West) Mumbai
India
Contact: Mr Vijay Doshi/Mr Nalin Doshi
Tel: +91 22 2578 3335
Fax: +91 22 2578 3338
Email: nalin@vimalfire.com/falgun@vimalfire.com
Website: www.vimalfire.com

Dealer/Distributor**HSE ENGINEERS PVT LTD**

2, Durgas Niwas, 1st Floor
Bhawani Tower Compound
Behind Bhawani Petrol Pump
IIT Powai
Mumbai 400076
India
Contact: Mrs Sapna Prajapati
Tel: +91 22 2578 7014 / 7015
Fax: +91 22 2578 7016
Email: hsemumbai@hseengineers.com
Website: www.hseengineers.com

Dealer/Distributor**KOREA (SOUTH)****ROYAL INDUSTRIAL TECHNOLOGY CORPORATION**

Royal Building, 3rd Floor
840-5 Yeoksam-Dong
Kangnam-Ku
Seoul 135080
Korea
Contact: Mr E S Kim/Mr J K Chung
Tel: +82 22 009 1800
Fax: +82 2 567 8831
Email: kes@ritco.co.kr/jkchung@ritco.co.kr
Website: www.ritco.co.kr

Dealer/Distributor**MALAYSIA****FITTERS DIVERSIFIED BERHAD**

No, 1 Jalan Tembaga SD5/2
Sri Damansara
52200 Kuala Lumpur
Contact: Dato' Richard Wong/Mr K K Fong
Tel: +60 3 6276 7155
Fax: +60 3 6175 2780
Email: kkfong@fittersgroup.com
Website: www.fittersgroup.com

Dealer/Distributor**SYARIKAT LETRIK CHEN GUAN SDN BHD**

Lot 1178 Jalan Subang 3
Taman Industri Sg.
Penaga
47610 Subang Jaya
Selangor
Malaysia
Contact: Mr Choong Yew Lim
Tel: +603 5634 1436
Fax: +603 5634 2349
Email: chenguan@streamyx.com

Dealer/Distributor**PAKISTAN****EVERGREEN DEVELOPMENT CORPORATION**

Suite # 514, 5th Floor
Clifton Centre
Block 5 Kehkashan, Clifton
Karachi 75600, Pakistan
Contact: Mr Munawar Afridi
Tel: +92 21 5873 448
Fax: +92 21 5870 080
Email: genco@cyber.net.pk
Website: www.edcpl.com

Dealer/Distributor**SINGAPORE****ACCLAIM SYSTEMS PTE LTD**

Blk 21 Kallang Ave # 04-165
Singapore 339412
Contact: Mr Michael Mok
Tel: +65 6299 0798
Fax: +65 6299 3735
Email: michael.mok@aspl.com.sg
Website: www.acclaim.sg

Dealer/Distributor**SWISS SECURITAS ASIA PTE LTD**

No. 56 Serangoon North Ave 4
#06-03, Singapore 555851
Singapore
Contact: Mr Andy Gan/Mr Michael Boon
Tel: +65 6853 8066
Fax: +65 6853 5939
Email: mike.boon@securitas.sg
Website: www.securitas.sg

Dealer/Distributor**TAIWAN****ATLAS TECHNOLOGY CORPORATION**

22F, No 1 Bausheng Road
Yunghe City
Taipei, Taiwan 234, R.O.C.
Contact: Mr David Liu
Tel: +886 2 223 20 556
Fax: +886 2 223 16 657
Email: david@atlasgroup.com.tw/
hunter@atlasgroup.com.tw
Website: www.atlasgroup.com.tw

Dealer/Distributor**KGIC TECHNOLOGY CO LTD**

No 36, Yingming 1st Road
Qianzhen District, Kaohsiung City 80649
Taiwan R.O.C.
Contact: Mr Franco Lee
Tel: +886 7 715 4285/+886 7 7715 829
Fax: +886 7 711 2811
Email: lic@ms9.hinet.net

Dealer/Distributor**UNIVERSAL PATHS DEVELOPMENT CORPORATION (UPDC)**

9F-1, 306, Sec. 1, NeiHu Road
Taipei 114, Taiwan R.O.C.
Contact: Mr Terry Chung/Ms Ellie Chou
Tel: +886 2 8751 6055
Fax: +886 2 8751 6053
Email: ellie@updc.com.tw
Website: www.updc.com.tw

Dealer/Distributor**THAILAND****AEGIS FIRE SAFETY CO LTD**

19/9 Pechphirun Building 3rd Floor
Thetsabansongkhro Road
Ladyao, Chatujak, Bangkok 10900
Contact: Mr Quek Yong Siah
Tel: +66 2158 0338
Fax: +66 2158 0340
Email: ysquek@aegis-fs.com

Dealer/Distributor**FIRETRADE ENGINEERING CO LTD**

21/56 Soi Soonvijai, Rama IX Road
Bangkapi, Huaykwang
Bangkok 10320, Thailand
Contact: Mr Taksin Tantipijit
Tel: +66 2641 4707
Fax: +66 2203 0533
Email: taksin@firetrade.co.th

Dealer/Distributor

**AUSTRALIA****FIRE & RESCUE AUSTRALIA PTY LTD**

190 Main Rd, Blackwood, South Australia, 5051
 Contact: Dale Thompson
 Tel: +61 8 8370 2739
 Fax: +61 8 8370 2738
 Email: dale@fireandrescueaustralia.com

Dealer/Distributor**FIRE & SAFETY WA**

96 Furniss Rd, Landsdale, Western Australia, 6065
 Contact: Kerry Lovett
 Tel: +61 8 9302 3210
 Fax: +61 8 9302 6110
 Email: kerry.lovett@fireandsafetywa.com.au

Dealer/Distributor**SOLBERG ASIA PACIFIC PTY LTD**

PO Box 182, Kingswood NSW 2747, Australia
 Contact: Ted Schaefer (Technical Manager)
 Tel: 61 2 9673 5300
 Email: ted@solbergfoams.com
 Website: www.solbergfoams.com

Representative Office**MALAYSIA****RHINOSHIELD INDUSTRIES(M) SDN BHD**

H-0-5 Ground Floor Plaza Damas,
 No. 60 Jalan Sri Hartamas 1, Sri Hartamas
 50480 Kuala Lumpur, Malaysia
 Contact: C K Lim (General Manager)
 Tel: +603 62033850
 Fax: +603 62032245
 Email: rhinoshield@pd.jaring.my

Dealer/Distributor**SINGAPORE****CMA ENGINEERING SINGAPORE PTE LTD**

1, Yishun St. 23, #04-01 YS-One, Singapore 768441
 Contact: Christopher Lee
 Tel: +65 6563 6860
 Fax: +65 6563 2366
 Email: chrislee@cma.com.sg

Dealer/Distributor**AUSTRALIA****GAAM EMERGENCY PRODUCTS**

29 Temple Dr., PO Box 211, Thomastown
 Victoria 3074, Australia
 Tel: +61 3 9466 1244
 Fax: +61 3 9466 4743
 Email: iprice@tycoint.com
 Website: www.gaam.com.au

Dealer/Distributor**HONG KONG****ROTTER INTERNATIONAL LTD**

Flat B 1/F Block 3,
 Kowloon, Hong Kong
 Tel: 85227517770
 Fax: 85227562051
 Email: jacky@rotter.com.hk

Dealer/Distributor**INDIA****FOREMOST TECHNICO PVT LTD**

M-1, Green Park Extension
 New Delhi 110016, India
 Tel: +91 (11) 2619 6982
 Fax: +91 (11) 2616 6961
 Email: foremost@hathway.com
 Website: www.foremost-india.com

Dealer/Distributor**INDONESIA****PT PALMAS ENTRACO**

Jl. Krekot 85, Jakarta-Pusat, Indonesia
 Tel: +62 (21) 384 1681
 Fax: +62 (21) 380 2660
 Email: sales@palmas.co.id

Dealer/Distributor**JAPAN****YONE CORPORATION**

23, Nishinakaai-Cho, Nishinokyo
 Nakagyo-Ku, Kyoto 604, Japan
 Tel: +81 (7) 582-11185
 Fax: +81 (7) 580-12263
 Email: t.yone@myad.jp
 Website: www.yone-co.co.jp

Dealer/Distributor**KOREA (SOUTH)****SHILLA FIRE CO LTD**

433-11 Non Hon-Dong, Nam Dong-Gu
 Incheon City 405-300, South Korea
 Tel: +82-02-3665 9011
 Fax: +82-02-3663 9113
 Email: kofire77@hotmail.com
 Website: www.firekorea.com

Dealer/Distributor**MALAYSIA****SENTRIX TECHNOLOGY SDN BHD**

No. 2A-2, 1st Floor Jalan USJ 21/7
 UEP Subang Jaya, 47630 Subang Jaya
 Selangor Darul Ehsan, Malaysia
 Tel: +603 8023-5228
 Fax: +603 8023-5618
 Email: chong@sentrix.com.my
 Website: www.sentrix.com

Dealer/Distributor**NEW ZEALAND****TYCO SAFETY PRODUCTS**

6 Portage Road
 New Lynn Auckland 0600, New Zealand
 Tel: +64 9 826 1707
 Fax: +64 9 826 1740
 Email: sgurnick@tycoint.com
 Website: www.tycosafetyproducts.com

Dealer/Distributor**PAKISTAN****FIRESTOP PVT LIMITED**

6/B, 1st Floor
 Dinar Chambers, PO Box # 5786
 West Wharf Road, Karachi-74000
 Pakistan
 Tel: 9221-2315675, 2313065
 Fax: 9221-2310457, 5831015
 Email: info@firestopaids.com
 Website: www.firestopaids.com

Dealer/Distributor**PHILIPPINES****ALLIANCE INDUSTRIAL SALES**

Unit 4, Finlandia Town Homes
 #1700 Dian
 cor. Finlandia Street
 Brgy, San Isidro, 1234 Makati City
 Philippines
 Tel: +63 21 7546 1749
 Fax: +63 2 887 7173
 Email: alliance8@pltdsl.net

Dealer/Distributor**SINGAPORE****S.K. ROSENBAUER PTE LTD**

8 Tuas Drive 2
 Singapore 638643
 Singapore
 Tel: +65 6862 3155
 Fax: +65 6862 0273
 Email: houchin@skrosenbauer.com
 Website: www.skrosenbauer.com

Dealer/Distributor**TAIWAN****YONE CORPORATION**

23, Nishinakaai-Cho
 Nishinokyo, Nakagyo-Ku, Kyoto 604, Japan
 Tel: +81 (7) 582-11185 Fax: +81 (7) 580-12263
 Email: t.yone@myad.jp
 Website: www.yone-co.co.jp

Dealer/Distributor**THAILAND****ANTI-FIRE CO LTD**

316-316/1, Sukhumvit 22 Road
 Klongtoey Klongtoey, Bangkok 10110, Thailand
 Tel: +66 2259 6898 Fax: +66 2258 2422
 Email: sithichai@antifire.com
 Website: www.antifire.com

Dealer/Distributor**VIETNAM****TAN DUC JOINT STOCK COMPANY**

N15-16 D2 Street, Ho Chi Minh City, Vietnam
 Tel: 84838990678 Fax: 84838990698
 Email: vntechdyn@hcm.fpt.vn
 Website: www.tanducco.com.vn

Dealer/Distributor**XTRALIS****AUSTRALIA****XTRALIS – MELBOURNE**

4 North Drive, Virginia Park
 236-262 East Boundary Road
 Bentleigh East VIC 3165 Australia
 Tel: +61 (0) 3 9936 7000
 Fax: +61 (0) 3 9936 7201

Regional Head Office**HONG KONG****XTRALIS – HONG KONG**

Room 2301, World-Wide House,
 19 Des Voeux Road, Central, Hong Kong Office
 Tel: + 852 2916 8876
 Fax: + 852 2916 8897
 Email: ggan@xtralis.com
 Website: www.xtralis.com

Regional Head Office**Phone Numbers for Other Xtralis
Offices in Asia Pacific:****BANGALORE, INDIA**

Tel: +91 98866 43314

BEIJING, CHINA

Tel: +86 10 8225 0695
 Fax: +86 10 8225 0716

BRISBANE, AUSTRALIA

Tel: +617 3246 5253
 Fax: +617 3216 6599

CHENGDU, CHINA

Tel: +86 28 6808 6172

MUMBAI, INDIA

Tel: +91 224 264 7770
 Fax: +91 224 264 7775

NEW DELHI, INDIA

Tel: +91 97 1114 1416

SYDNEY, AUSTRALIA

Tel: +612 9808 2577
 Fax: +612 9808 2599

SEOUL, SOUTH KOREA

Tel: +82 10 9102 0914
 Fax: +82 2 553 8832

SINGAPORE

Tel: +65 6570 1864
 Fax: +65 6570 1823

SHANGHAI, CHINA

Tel: +86 21 5240 0077
 Fax: +86 21 5238 2443

TAIPEI, TAIWAN

Tel: +886 2 2657 1962
 Fax: +886 2 2657 2094

WUHAN, CHINA

Tel: +86 27 8668 1621
 Fax: +86 27 8668 1621

SUBSCRIPTIONS

ASIA PACIFIC FIRE MAGAZINE

GET YOUR SUBSCRIPTION NOW!!!



**APF IS PUBLISHED 4 TIMES A YEAR
– MARCH, JUNE, SEPTEMBER
AND DECEMBER**

Name: _____

Company/Organisation: _____

Address: _____

Telephone: _____

Fax: _____

E-mail: _____

Start Subscription from Issue: _____

Subscription Rates: Sterling £50.00 AUS Dollars – \$100.00
US Dollars – \$70.00

Back Issues: US \$18.00, £10.00 or AUS Dollars \$20
each inclusive of P&P (subject to availability)

METHODS OF PAYMENT:

Website Subscription: www.mdmpublishing.com

Cheque: _____ MDM Publishing Ltd.

Visa/Mastercard No: _____

Expiry Date: _____ Security Code: _____
(last three digits on reverse of card)

If paying by credit card please fax details. DO NOT post/mail.
Fax: +44 (0) 1935 426926

MDM Publishing Ltd.

The Abbey Manor Business Centre, The Abbey, Preston Road,
Yeovil, Somerset BA20 2EN, United Kingdom

ADVERTISERS' INDEX

Bauer Compressors Asia Pte Ltd	42
Bio-Ex	41
Blücher GmbH	45
Bristol Uniforms Ltd.	42
Coltri Asia Pacific	41
Con-Space Communications	28
Control Logic s.r.l.	2
Cutters Edge	13
Dafo Fomtec AB	14
Draeger Safety Asia Pte Ltd.	OBC
Dr. Sthamer Hamburg	25
DuPont Fire Extinguishants	32
Dynax Corporation	21
Elkhart Brass Mfg Co Inc	22
Fike Corporation	38
Fire Fighting Enterprises	35
Fire Fighting Foams Coalition	19
Firetrace International	52
Holmatro Rescue Equipment	28
Janus Fire Systems	35
NFPA	04
PBI Performance Products, Inc.	IBC
Pelican Products Australia	31
Plastika Akrapovic	51
Securiton AG	48
Simulation Ltd	27
Solberg Asia Pacific Pty. Ltd.	26
Super Vacuum Manufacturing Inc.	49
Task Force Tips, Inc.	IFC
Texas A & M Emergency Services Training Institute	24
Unifire USA	46
Xtralis Pty Ltd.	56
Ziamatic Corporation	45



Proudly Saluting Queensland Fire & Rescue Authority for Adopting PBI.

PBI Matrix®... The Power Grid.



Better performance, better comfort and better value in outer shell protection. PBI Matrix takes PBI's proven protective characteristics of unmatched flame and thermal protection to another level by reinforcing them with a unique grid of high strength aramid filament fiber — for unsurpassed performance and durability. Tough and rugged, PBI Matrix responds call after call and remains service worthy by providing increased resistance to rips, tears and abrasions. This revolutionary outer shell is lightweight, fast drying, and offers superior comfort and reliability. More than just premium protection, it's a valuable asset in your fire fighting arsenal...PBI Matrix. What else would you expect from the people who set the standard for unmatched personal protection and performance...PBI Gold®, PBI Matrix® and PBI TriGuard® see the difference.

PBI Performance Products, Inc. // 9800 Southern Pine Blvd Suite D // Charlotte, NC 28273 // 800-858-2467 // pbiproducts.com

22 Mallard Way // Pride Park // Derby DE24 8GX UK
T +44 (0) 1332 290466 // F +44 (0) 1332 290952
E-mail: ian.callaghan@pbiproducts.com

Im Gewerbepark D23 // D-93059 Regensburg, Germany
T +49 (0) 941 465 275 9-9 // F +49 (0) 941 465 275 9-8
E-mail: helmut.zepf@pbiproducts.com

PBI Gold, PBI Matrix and PBI TriGuard are registered trademarks of PBI Performance Products, Inc. © 2011. All rights reserved.



Designed to
go through
fire with you.



The new Dräger PSS® 5000 compressed air breathing apparatus

No matter what danger you are faced with: the new Dräger PSS 5000 adapts to your operational conditions. You can select from two harnesses: the basic Dräger Standard (DS) variant and the Dräger Professional (DP), which is particularly robust and offers maximum comfort. To avoid snagging, medium and high-pressure lines are integrated in the back plate.

The hoses can be individually routed over the left or right shoulder. The prevention of excessive dirt and water ingress and the ease of dismantling without the need for additional tools results in a harness which is easy to clean and decontaminate and keeps maintenance downtime to a minimum.

Within a short time, your Dräger PSS 5000 is ready for the next challenge. www.draeger.com